THE IRON AGE — November 15, 1934

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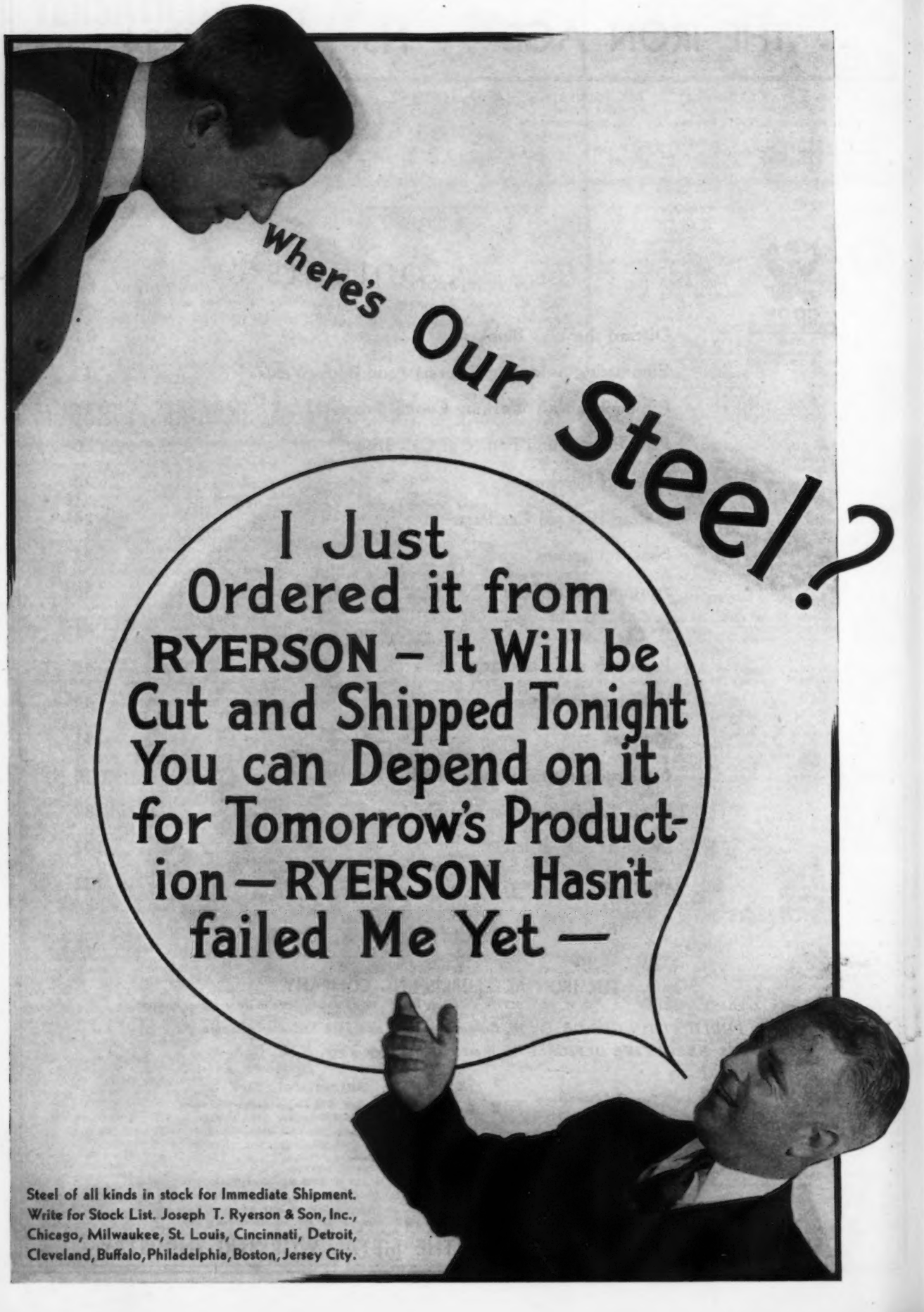
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NOVEMBER 15, 1934

ESTABLISHED 1855

Vol. 134, No. 20

Don't Stay Under a Wet Blanket

SOME of our readers may regard the election results as being a metaphorical wet blanket spread over business and industry. It may be well to advise those who feel that way that live wires do not stay long under wet blankets. They crawl out quickly and exercise vigorously to avoid giving the undertaker a job.

We do not regard the election landslide as constituting a mandate for radicalism. In fact, there are certain advantages in an overwhelming political majority, even if it lies in the party for which one did not vote.

A large majority in Congress, for example, may be better for business and worse for radicalism than a more evenly divided balance of power. There is less temptation to play ball with organized minorities who seek to trade. The bonus seekers and the labor lobby would be in stronger position with a more evenly balanced Congress.

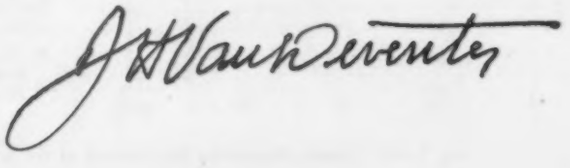
Then, too, radicalism has suffered an encouraging defeat in California. The people of that State have put definite limits beyond which they do not want the New Deal to go. That is a salutary victory for mass common sense that will head off many embryonic unsound proposals.

Congress can write our legal statutes, but business and industry will continue to write the people's meal tickets. Legislation cannot repeal the law of supply and demand or the law of the survival of the fittest.

Landslides never run up hill. The late political landslide would not have happened if there had not been a depression valley to receive it. The coming Congress may try to prescribe patent medicines for business if it remains sick or if it loses ground; it will not hastily do so if the patient is showing real improvement.

The time is getting ripe for another landslide; that of demand for steel, machinery and manufactured goods to fill the great accumulated void of needs in this country.

That most desirable event will not happen, however, if we regard the election as a wet blanket and remain shivering under it. It *will* happen if we all forget politics for a while and get busy at our real job of realizing profits and building payrolls.



Soldering-Over of Auto Body Welds

By PETER W. FASSLER
President, P. W. Fassler & Co., and Consulting Welding Engineer, Detroit

IT can be safely said that approximately 90 per cent of all automobile bodies in this country are flash welded.

The present daily production of about 15,000 bodies divided among the various automobile plants involves some 48 miles of welded seam. This figure covers only the rear body welding, which averages 90 in. in length on modern streamline bodies. It does not include the shroud or the roof rail, which are also flash welded; with these approximately 6 miles of flash-welded seam would have to be added to the 48 miles of rear body welding. Such figures indicate clearly that the flash welder plays a very important part in automobile production.

Recently a leading European automobile manufacturer told the writer that the flash welding of automobile bodies was not entirely satisfactory, as every seam had to be soldered over after welding. I pointed out that one of the largest automobile manufacturers in the United States flash welds an average of 4500 bodies a day in different assembly plants and has not used an ounce of solder in years in connection with this welding.

To this he replied that he had studied automobile manufacture in America from every angle and had found that almost all bodies made here were soldered-over after flash welding. Furthermore, the flash-welding machines he had employed were purchased from American builders.

As my familiarity with conditions was more or less limited to the company whose practice I had mentioned, I could not pursue the argument further.

Soon after my return to the United States a statement made by a high executive of a body building plant at a safety meeting brought back to mind the conversation cited above. It was that his company had encountered many cases of lead poisoning from body soldering. This statement, together with data received since relating to body-welding machines, has moved me to discuss this problem.

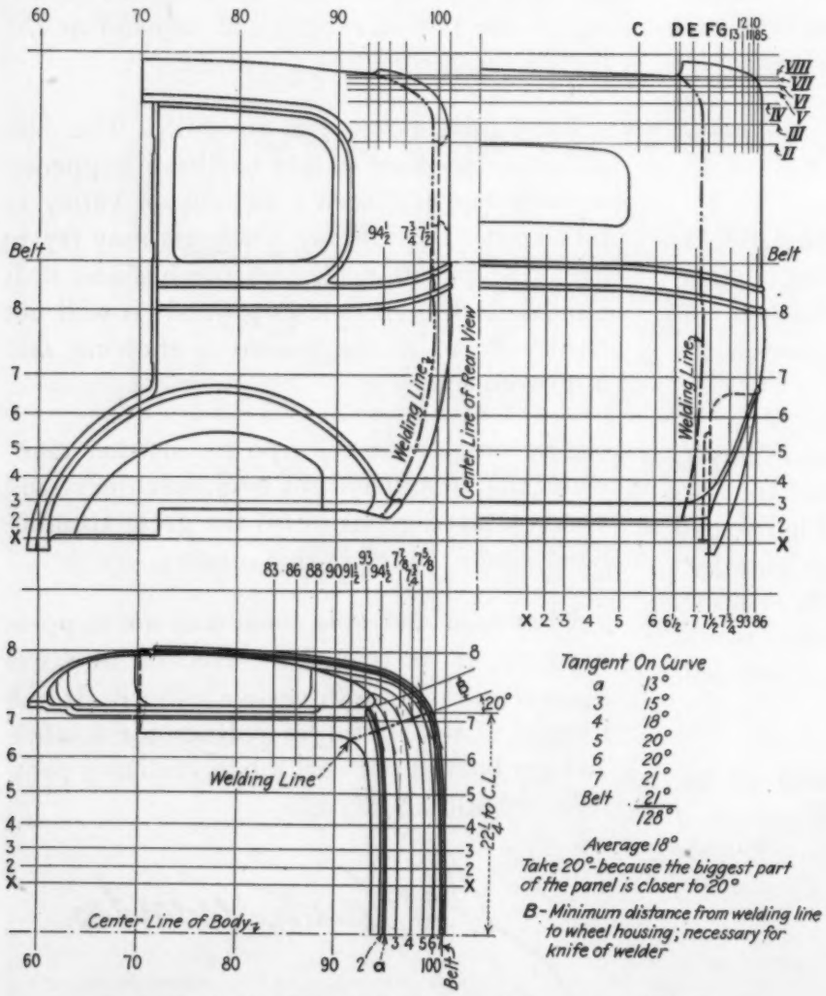


Fig. 1—Die drawing illustrating development of the proper welding line.

Trouble Experienced at First

It is to be frankly admitted, perhaps, that when flash welding of auto bodies was introduced about nine years ago, plenty of trouble was experienced, even if the seams to be welded were only about 20 in. long. Proper synchronizing of current and upsetting movement, clamping pressure, and the proper electrode material had to be studied thoroughly. But most important—and still so in many organizations—was the determining and developing of the proper welding line with the proper tangents. By means of the die drawing shown in Fig. 1, which is similar to that received by the machine designer from the body engineering department, we shall endeavor to explain the development of the proper welding line. In our example the body can have any shape.

The first step would be to determine the welding line on the side

Eliminated by Proper Procedure

quarter panel *C*. The distance between the wheel housing and the welding line must be great enough to allow for the proper clamping device. Two inches from the wheel housing is sufficient. The imaginary welding line *W*...*L* has to be as close as possible to the tangent lines *a-3-4-5-6-7* and the belt line. In many cases, where the proper tangency after the welding line *W*...*L* is determined the tangent lines can be projected to *A* and *B* (Fig. 1). This enables making a dummy from which proper templates can be made for the electrodes. Not only will these templates be of great importance, but a spotting block can be produced from this dummy to enable tuning in the electrode to conform with the shape of the dummy and the stampings respectively.

AT RIGHT

Fig. 3—One of the larger type machines required for welding modern airflow bodies.

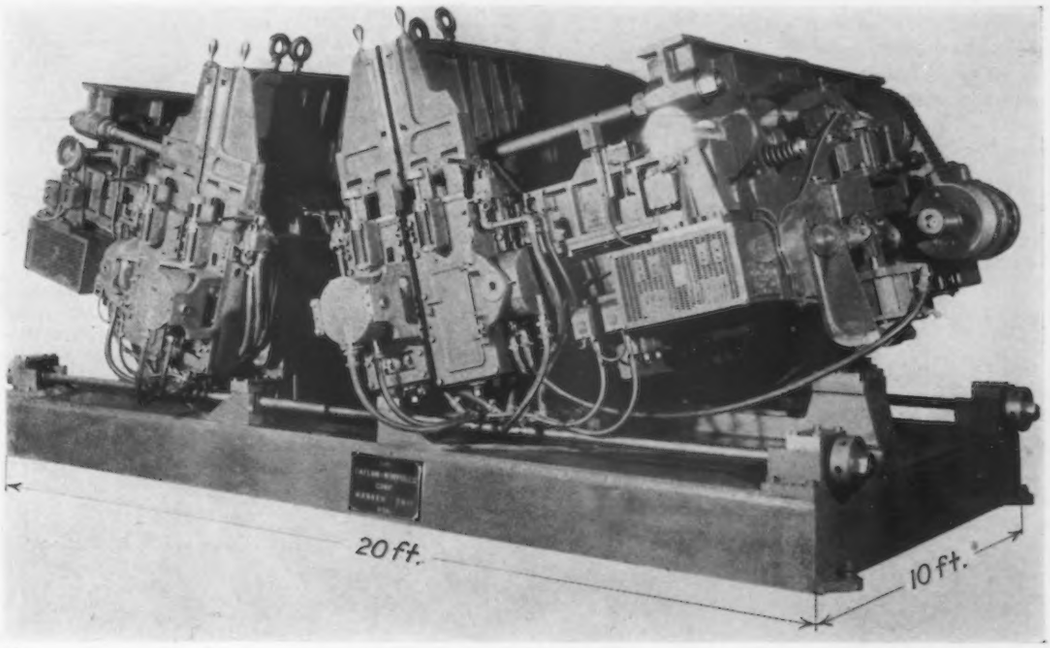


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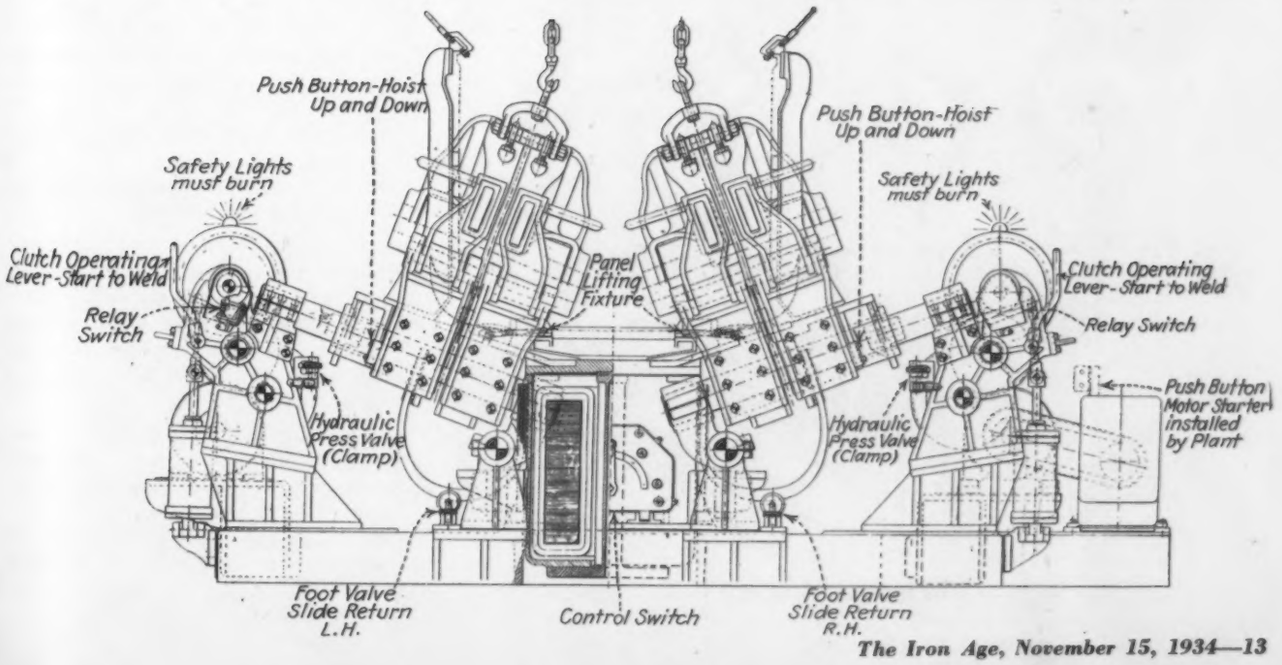
Fig. 2—Rear-body double welder, a single-transformer, 300-kva. unit for smaller bodies.


Push Button-Hoist Up and Down
Push Button-Hoist Up and Down
Safety Lights must burn
Safety Lights must burn
Clutch Operating Lever-Start to Weld
Relay Switch
Panel Lifting Fixture
Clutch Operating Lever-Start to Weld
Relay Switch
Push Button Motor Starter installed by Plant
Hydraulic Press Valve (Clamp)
Hydraulic Press Valve (Clamp)
Foot Valve Slide Return L.H.
Control Switch
Foot Valve Slide Return R.H.

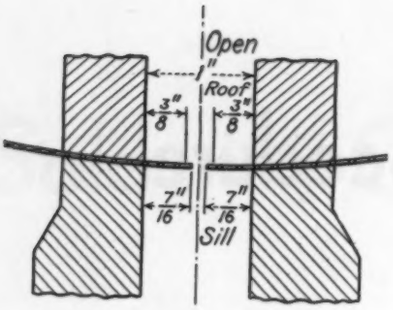


Fig. 4—Correct line-up of panels.

The designer is now able to determine the width and the angle of the welding machine. Arrangement of such a welder is shown in Fig. 2, which is a 300-kva. unit for smaller bodies. It is of single-transformer type and weighs approximately 14 tons. Much larger machines are required for the modern airflow body, which has approximately 100 in. of seam length; and some of them are equipped with two, four or six transformers and weigh up to 40 tons (see Fig. 3).

In most cases a perfect welding line with perfect tangents cannot be reached and an average angle has to be selected, as shown in Fig. 1, but a perfect weld can be obtained provided the difference in these angles is not too great. Trouble occurs in neglecting the proper fit of the electrode and in improper alinement. In Fig. 4 is shown the correct line-up of panels and in Fig. 5 the incorrect line-up.

Putting the panel in the electrode incorrectly, as in Fig. 5, which happens quite frequently through wrong setting of the fixture or improper trimming of the panel, causes holes and flat spots, which give rise to considerable trouble and result in high cost of metal finishing. In addition, as the welding proceeds there is a tendency to overlap, as shown in Fig. 6. The explanation is that although the weld stock burns equally, both ends burn off and some parts get caught against the electrode, and as these parts are still white hot they tend to overlap. Another source of trouble is the burning out of the electrode and the knife. Inexperienced operators often try to overcome this trouble by filing down the overlapped joint, but this leads to a weak spot, with the body usually breaking on the welding line. However, the easiest way out for the production man who doesn't know the real reason for the trouble is to solder the seam over and play safe.

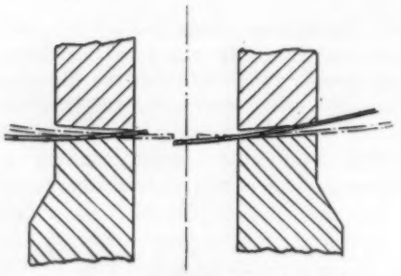


Fig. 5—Incorrect line-up of panels

It has been proved that by following the procedure here suggested as to the trimming line, proper fixture setting and proper alinement, bodies can be welded without using a single ounce of solder. The welding machine is frequently blamed, but this cannot be justified, because the modern flash welder is a very highly developed unit.

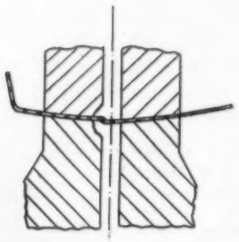


Fig. 6—Wrong location results in overlap in the panel and destruction of electrodes and knives as here shown. It also causes deforming of panels as illustrated in Fig. 5.

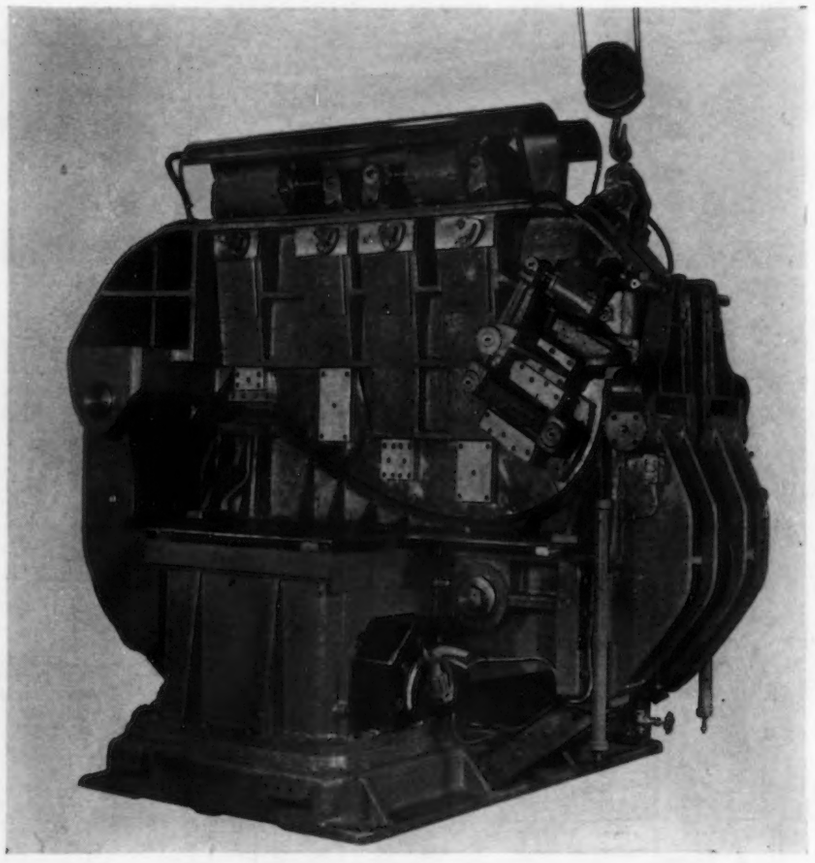


Fig. 7—Machine for flash welding front fenders.

It has been stated that it costs about 50c. to solder over an automobile body. At this rate a plant having a daily production of 1000 bodies controls the expenditure or saving of $500 every day in making the right set-up. The company mentioned above as not using any solder in its daily production of 5000 bodies not only saves the cost of the soldering but also considerable in compensation for men injured through lead poisoning. Also, since acid is used for soldering the black sheet metal, the entire body suffers sooner or later, as the acid tends to work through the paint and cause blisters.

Not only are automobile body parts flash welded successfully, but also fenders, radiator shells and other parts. A machine for flash welding front fenders, which are welded following the contour through the center, is shown in Fig. 7.

The increase in length of the welding line on the modern automobile body calls for such huge and expensive welding machines, which automatically carry high overhead and depreciation, as to raise the question

(Concluded on Page 69)

Few Months' Experience with Working-Capital Loans

WILLIAM H. POUCH, president, Concrete Steel Co., New York, is chairman of the industrial advisory committee of the Second Federal Reserve District. Such a committee under an amendment to the Federal Reserve Act is collaborating with the banking systems of each district to extend loans to companies which, as Mr. Pouch puts it, have Capacity and Character, but need Capital. The additional capital to help stem the tide is lent for periods up to five years.

WORKING capital loans of the intermediate credit class, that is, loans that may be allowed to run for five years, have been open to business and industry now for a period of a few months. Requests for such banking accommodation have come in the meantime in sufficient number and variety to make the experience likely helpful as to its practicality and promise, so when a meeting of credit men was called in New York, Oct. 30, at the Hotel Commodore, to hear results, broad direct interest was evidenced by a large attendance and an active discussion.

The meeting was devoted to the operations in this particular of the Federal Reserve Bank of the Second (New York) District. It was addressed by William H. Pouch, president of the Concrete Steel Co., who is chairman of the industrial advisory committee of five industrialists, set up, one such committee in each Federal Reserve District, for the express purpose of assisting the Federal Reserve Banks in passing on loan applications. The plans of the Federal Reserve intermediate-credit working-capital loans, provided for under amendment 13B so-called of the Federal Reserve act was explained at some length in these columns in the issue of Aug. 16, page 28.

Mr. Pouch told how the applicant for a loan proceeds, how the application is then handled, and what is the banking attitude in the matter, and he gave an analysis of the operations for the relatively brief period covered. In addition he offered for discussion some 10 or 12 hypothetical cases, presenting financial statements and accompanying particulars to bring out the character of problem that has to be met in dealing with the loans. Following is what Mr. Pouch said in part:

From Mr. Pouch's Address

A LOAN for working capital can be sought in either of two ways.

First, he may apply to his local bank for application blanks and information as to how he should proceed. Even though he may have already secured accommodation from the local bank, he should not hesitate to make the approach through them. If the local bank cannot render him assistance, they will pass the application on to the Federal Reserve Bank and suggest they consider the application. In many cases the local bank will join with the Federal Reserve Bank and make the loan but secure a commitment on a percentage of it from the Federal Reserve Bank.

Second, the business man or corporation may approach the Federal Reserve Bank direct and make application for loan without going through an intermediary bank. Let me say in passing that the first method is preferred but the second method is allowable.

Borrower Must Meet One of Two Requirements

When the application reaches the Federal Reserve Bank, it is gone over very carefully by members of the staff of that organization. A thorough investigation is made regarding the financial condition of the applicant, and his ability to earn money. Inquiry will be made as to his character, his record with business and other financial institutions during his business career. The applicant is also required to state what he is going to use the money for and when and how he expects to earn money enough to repay same.

The Federal Reserve Bank will have two objects in view in making this investigation. First, to determine the applicants ability to earn the repayment, and second, to determine

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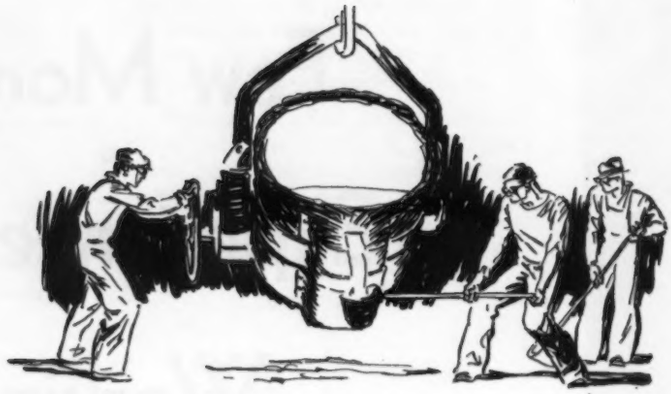


The Past, Present and Future of Cast Iron

By W. R. JENNINGS
Works Manager, The D. J. Ryan Foundry Co.

IN the yesterday of iron we find that iron was first used approximately six thousand years ago by the Egyptians. It was first found in the reinforcements of stone walls of some of their buildings, and we are lead to believe that the Chinese were using it at approximately the same time. Now, how early man first came to work in iron is a deep mystery and probably will always remain so.

The bronze age had been in progress some thousand years before man entered the iron age, and it is possible that in making up the mortar and walls for a bronze melting furnace that early man stumbled onto some iron. In this way was formed the beginning of the iron age. It is interesting to note at this point that if the original workers in iron used the iron of meteors they used a very advanced type of material. The chemical analysis of meteors shows from 80 to 95 per cent iron and from 6 to 10 per cent nickel. This, with other forms of rock, constitute the average meteor as found on the surface of the earth.

Early man melted his iron ore in a very crude furnace consisting of a scooped out place in some clay area. The walls were built up probably 6 to 12 in. thick with clay, fitted with clay tuyeres opening on the outside and penetrating towards the bottom. The furnace was filled with charcoal and ore. In fact, this process is actually followed in China and parts of Africa today.

The furnace, after charging, was sealed up and the air forced down through the tuyeres with blow pipes. The tuyeres themselves soon became hot as they penetrated down into the charcoal and this was the beginning of preheated air as used today in blast furnace operations. After about six hours the charge was ready to be removed from the furnace. The temperature of this furnace never was high enough to melt all the iron, but it did remove some of the slag and a portion of the iron which had absorbed carbon enough so that it became fluid. All of this was run off as slag. The mass which was left in the furnace when it was opened was a steely mixture of iron, slag and charcoal. It partook more of the nature of steel as we know it, of course, than cast iron, but this material was capable of being hammered and worked, reheated, rehammered and reworked to free it from slag, and made suitable for the various uses by the early iron workers.

From this early beginning in the use of iron and for the next four or five thousand years iron made but little progress. In fact, until the discovery of gun powder, the iron tonnage was relatively small. Up until the year 1500 there was really an inconsiderable amount used, and in this year a best record indicates that approximately 50,000 tons of iron was consumed in the world.

Cast iron, as such, was originally a waste material. In fact, because it was fluid and ran off and formed brittle pools in the cavities of the earth around the furnace, it was discarded because it was unworkable. The steel mass left in these early furnaces, of course, was workable by heat and hammering, and this really today

stands as one of the distinguishing features of the difference between steel and cast iron.

In India iron probably received its greatest advance prior to our historic age. As early as a thousand years before Christ, columns of iron weighing from seven to fifteen tons were produced by the Hindu iron workers. How it was possible for these people to melt so much metal and pour it into one unit, is beyond our present day comprehension. Imagine a column 42 ft. long, 3 ft. or more in diameter at the base and tapering to a foot and a half at the top, and we have a picture of the tremendous problem which these people overcame. How could they melt so much metal at one time? How could they handle it after it was melted? We do not know that. However, one of these iron columns still stands, a monument to a race long since gone.

Enthusiasm and skill! These were the tremendous activating forces. Benvenuto Cellini, when he cast his world-famous statue of Perseus, had not the fine tools and equipment of today. Yet history tells us that in the making of this job he worked day and night until the mold was completed and robbed his neighbors' fences of the oak rails, broke up his own furniture to secure enough fuel to melt the bronze and then threw in the silver and pewter ware of his own home into the pot to make enough metal to cast the statue. When the job was poured it had entirely run with the exception of one finger. A world masterpiece of skill and enthusiasm was thus born. Now we will talk later of alloys in iron, and yet it seems to me that before we reach this point we must realize that of all the alloys which can be mixed with iron the one which gives the greatest results is iron alloyed with brain.

Cast Iron Is Misnamed

Now what are the characteristics of this iron which plays an all-important part in present day life?

The various handbooks containing engineering standards for gray irons read somewhat as follows: a Brinell hardness of probably 160 to 170, a tensile strength of 17,000 to 18,000 lb. per sq. in. and a carbon content of 3.50 to 3.60 with a correspondingly high silicon. Now, when the engineering handbooks state that cast iron is a weak and a brittle material they are entirely correct. However, the name "cast iron" is a misnomer, for if we were to call a thoroughbred by the amount of pure blood it contains, a cast steel casting would surely be more correctly called *cast iron* than would the present mixture of iron and impurities which we call "gray cast iron."

HOW useful are the "ites" foundrymen are adding to their melts? Can gray iron maintain its position in the industrial matrix? What developments must founders anticipate? These and many other pertinent questions are discussed herein in a brisk and most interesting manner. Mr. Jennings is an able and experienced foundryman who has a clear insight into the industry's problems. He speaks the founder's language and consequently the theme he develops is even more forceful.

However, we will agree that it is cast iron. But research and time have given us a knowledge of the blood which runs in the veins of a good casting and we foundrymen, who are today making iron of 50, 60, or whatnot thousand tensiles, feel that we have made some advance and resent the rating which our material has been given for the last 50 years.

A number of foundrymen have been working on new tests and ratings for tensile strength of iron in order to make this humble material more aristocratic. Yet no matter what rating they may give you for iron, whether it be 20, 30, 40 or 50 thousand tensiles, there will be for a considerable length of time a great quantity of the so-called gray iron of our text books still used. After all this is the cheapest form of iron and where rigidity, machineability and little strengths are the prime requisites, this material will suffice.

It was previously stated that gray cast iron with respect to its physical properties is primarily regulated by control of its impurities. We have in the past perhaps given too little consideration to these impurities, where now we have means for detecting practically all and of regulating the amount of impurities in the individual casting. It has been found upon competent research, however, that irons of identically the same analyses, as far as we are able to determine, have various essential different characteristics. This is still one of the troublesome things in gray iron work. An A.F.A. committee is investigating so-called "off-pig iron." This name probably describes the iron but the causes are so hard to put definitely on the spot. We foundrymen are very prone to pass the buck. When we have some difficulty in the foundry, which seldom escapes any of us, we have a merry chain which starts with the molder, jumps to the sand, jumps to the core, jumps to the metal, jumps to the cupola operation, and then because the furnaceman is not there, it lodges sometimes with him.

John Sharp showed by experiment that pig iron remelted thirteen times becomes too sluggish to run castings, it is full of gas holes and is very brittle. Phillips, of Frank Foundries Corpn., ran tests on a 100 per cent scrap mix. He noted that the analyses of this material did not tell the story; an iron of say 2.00 silicon and 3.40 carbon today might be soft and gray, and the same analysis may be mottled and white the next time. This is due to the included oxides and gases which we do not as yet analyze for. A casting shrinks today that did not shrink yesterday. What is the answer?

If we could only pin some of these causes on the pig iron manufacturers, what a wonderful new ray of hope that would be for the average man in charge of melting operations. Our present day cast iron offers a wide variety of selections, with moderate control, in cupola practice and more definite control in electric furnace practice. This, of course, may be a point for debate, but I believe it can be sustained. As to the costs of the two processes, or as to the desirability under such conditions that is, of course, another thing.

Impurities Have Large Effect

In order to present the picture of what constitutes iron and its impurities, the simple elements which make up an iron casting could be collected separately. One package could represent 10 lb. of chemically pure iron; one bottle represents the sulphur; one the silicon; one the manganese; one the phosphorus; and still another the total carbon which is present in higher strength castings. In several small packages could be placed the

precious metals which are to be added, such as nickel, chrome, moly, etc. It should be noticed particularly that the volume of these impurities as compared to the iron is very small. When one sees such a small quantity, for example, of phosphorus, nickel, chrome or moly, one really wonders if these small amounts of impurities can have so great an influence on a casting. However we have the data to prove it, and we thus find that in higher strength irons which we are making today chemically speaking the adding of a pinch of this or a pinch of that to the batter makes an entirely different cake.

Now consider an iron of approximately 2.00 per cent silicon, 3.25 carbon, of which 0.70 is combined, 0.09 sulphur, 0.20 phosphorus, 0.60 manganese, 1.28 per cent nickel, and 0.74 chrome. To this is added a pinch of molybdenum, and thus is added seven to ten thousand pounds tensile strength—just like that!

No, that isn't the whole story! To obtain iron of this quality the control of each and all of the elements must be maintained. If one is definitely certain that an iron of a certain silicon, carbon, phosphorus and sulphur range is being produced then one will be reasonably secure in obtaining this increase in strength from the additional alloy, provided the cupola operation is normal.

In this connection, with the high-strength iron being produced today in the cupola and the electric furnace, it is wise to remember that whenever an iron is being produced lower than 3.00 per cent carbon and possibly one does not need to go even that low, the foundryman becomes a designing engineer. It is from this point, from the 3.00 per cent carbon to the 2.00 per cent carbon, that we enter a field where high shrinkage and tendencies for included gases are greatly increased and an added burden is put upon the foundryman in recommending the proper design of patterns for making this type of casting.

The average engineer still designs sharp corners. He delights in putting great heavy masses of metal off in some hidden spot and connected with the rest of the casting by a section several times thinner. In fact, everything that takes the joy out of life for the foundryman. We have seen castings being replaced by welded parts wherein the manufacturer spent unlimited engineering time in redesigning the job so that these parts could be welded. It can be said that in the welded jobs often the heavy parts and square corners worked out

much better than they had in cast iron. Cast iron lends itself particularly to flowing curves and is at its best when connected masses have plenty of fillets.

The cast irons of today are a multitude. We have as a result of the alloying fever many "ites" on the market; Gunite, Frankite, Ashcolite, Greenite, Ranite, Alligatorite from Birmingham, and in some cases "dynamite." These "ites" of course mean a lot or they mean nothing. When one person or company adopts a trade name for a product it issues a challenge or maybe a bluff. One must assume a reasonable control back of this trade name for a material. In our foundry operation we attempt a reasonable control of our carbon, silicon, and whatnot, within a definite standard which we have set for ourselves. This forms the base iron to which we add our alloys as required.

Now all the spices in the world won't make a bad fish smell any better, and all the alloy that can be used will not correct the mistake in a poor base iron. Therefore, in getting the best out of alloys in the cupola one must remember that the field is often rather limited, for in the average foundry not more than two base irons probably can be successfully run during a day. We will assume that a foundry has a soft base iron and a hard base iron. The soft iron, with a carbon of probably 3.50 to 3.60, and a hard base iron with a carbon of 3.20 to 3.30 and correspondingly low silicon. A foundry with these two irons to work upon during a day can secure only a limited variation by the addition of alloys to the molten stream.

The iron is melted at 2800 deg. F., and it is known that if an excess of 2.00 per cent of any combination of alloy is added then one is on the danger line and results, at the best, will be far from those desired. It then can be concluded that the amount of alloy which can be added cold to a molten stream of metal is rather limited and, secondly, that the variations in base metals which a foundry can regularly have are also limited. It is here that the electric furnace enters the field with its batch melting or duplex batch melting. It thus offers a wider range of base mixtures than is possible with the cupola, and also a practically unlimited range of alloy absorption.

Foundries Should Specialize

We have heard discussed at many meetings the different irons produced by various companies. We find foundries in various parts of the country making everything from soup to nuts. This is one of the reasons why foundrymen have lost a considerable tonnage to other fields of iron. In his eagerness to make anything that the market afforded, the foundryman does not give enough attention to the engineering and customer requirements and often produces a casting which does not fully meet the requirements of the job. He has followed the age-old advice of whatever you do, do well, and he attempted with the means at hand to make the best casting possible, with an impossible base iron.

The best a foundryman has now is not good enough. There are so many ranges of irons that could be made that any one series would take a lifetime of study to ferret out. We have just begun our study of the possibilities of iron, and yet we read of one foundry producing some fifty varieties of iron and holding them within a certain very definite limit. We do not question the ability of any of our foundrymen with the proper melting methods to make this many irons and also to control them, but we do question the necessity for such a range of iron. We feel that to properly make and control one iron and make it better is a real objective for the present day foundryman.

Experiment, of course, to which we are all more or less inclined, we would like to try every key on the piano. However, some of us can sing a high note, some of us can sing a low note, some of us can sing no notes at all, but whatever key is played, play it hard.

The automotive cylinder is today a work of art. It was developed in a specialty foundry and it is made today in specialty foundries. The cast iron crank shaft which is being used today in 50 per cent of the Ford productions is a specialty product and is made in a special unit. The really great strides in the use of iron and its alloys are made in special shops where men have given their efforts

undivided to overcoming one particular problem. We know that in the iron of today some wonderful castings are being produced. Steel castings are being reclaimed into the cast iron field. A certain amount of malleable is being absorbed by the new short anneal or bastard malleable which is now available, or it may be that a high strength iron with a short normalizing is replacing annealed iron where primarily it was used for shock resisting only.

The irons of tomorrow, we cannot help but feel, will be produced to a great extent electrically, for while there will always be a definite requirement for strong gray iron in hardware and small semi-rigid parts where great quantities are required, the iron of use tomorrow will be facing an entirely new field of specifications.

Aluminum, a material second only to iron in its supply on the earth's surface, is rapidly coming into use, and the amount of scientific study which is being spent on its development at the present time is far greater than the amount which is being spent on iron and its alloys. Aluminum and its alloys are directly competitive with iron in that iron to meet this new competition must be much stronger than the iron of yesterday. It must be as our salesmen would like to have it, a soft hard iron, an iron that will be easy to machine and yet will be hard in service, a material which will not rust readily, a material which will withstand heat, a material which will cast readily and, withal, be produced without too great a cost.

No industry is born without producing a train of allied industries. The railroads, for example, today are at the beginning of a new birth. The streamline coaches will become a reality. The railroads are going to be forced to relay their roadbeds to meet this new condition—to transform the curves for the terrific speed of the new coaches. As regards these new coaches, what will be used in their construction? Will they be of aluminum and its alloys entirely, of lightweight steel or will iron fit into the picture? That depends upon the foundryman. The engineer, after all, is an unbiased individual. He is critical and cynical of all materials. He comes from Missouri and has to be shown.

With that rebuilding spirit gaining momentum in America in the airplane industry and in the railroads, the picture for tomorrow is tremendous, particularly with airplanes. Now, what part does iron play in this picture? We thought that cast iron didn't have an opportunity at all in an airplane, and yet suddenly it is thrust at us if we can meet the specifications. Now into this picture enters the electric furnace. The electric furnace is bound to become the melting unit of tomorrow just as railroads will probably be electrically propelled tomorrow. At the present time, we know that these new streamlined trains are probably Diesel power, Diesel-electric or gas-electric, but when one considers that it takes approximately eight pounds of coal to produce a horsepower in a locomotive and one horsepower can be produced with one and a half pounds of coal at the mouth of the mine, we believe the electric energy will be available in the future at better rates than are obtained at present.

When electrical energy becomes cheaper, as it must, then the electric furnace will come into its own. Cupola melting, at its best and controlled with all the latest devices of blast control, automatic charging, has changed little from the first cupola operated. The amount or variation of any one element in iron is consequently very definitely restricted.

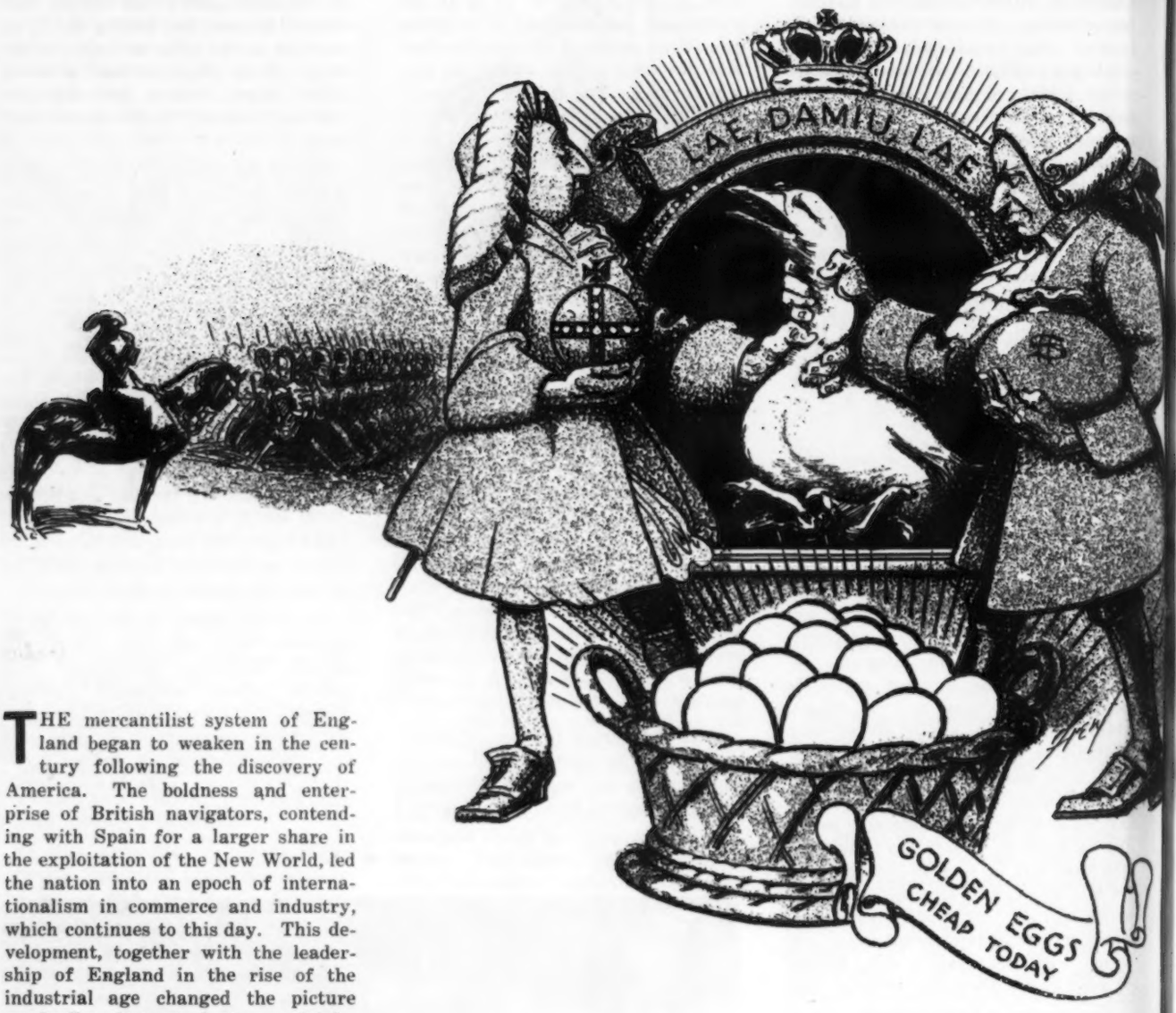
With the electric furnace, of course, the iron can be varied at will. As the metallurgists and engineers determine what is required in an iron to give it any desired quality, the electric furnace is the tool for making it. If an engineer knows what he wants in the range of an alloy of that metal in nickel, copper, chrome, and what-nots, this can be done with the electric furnace.

Today the electric furnace process is costly and for a shop making castings by the batch method it is not possible to operate in competition with cupola produced metal. However, when the electric furnace enters the range of castings of 3.00 per cent carbon and under, which cannot readily be produced in the cupola, then it enters a field of its own where the characteristics of the metals produced warrant the additional cost of melting, even at the present rates. There are other fields of melting to be sure. The Brackelsberg furnace and others, all of which use some contaminating fuel to melt the iron, will be and are highly satisfactory melting units for certain ranges of metal.

We would predict in the iron of tomorrow, then, an iron electrically melted, probably electrically heat treated where necessary, castings X-rayed for defects, molten iron analyzed by spectrograph or some similar method, and much greater stress than at present placed upon exact chemical analysis.

▲ ▲ ▲

Cast iron pavement is not unknown abroad, having been used for some time. This picture, however, is said to represent the initial installation in this country. It is a 30 ft. test strip, laid at the University of Minnesota.



THE mercantilist system of England began to weaken in the century following the discovery of America. The boldness and enterprise of British navigators, contending with Spain for a larger share in the exploitation of the New World, led the nation into an epoch of internationalism in commerce and industry, which continues to this day. This development, together with the leadership of England in the rise of the industrial age changed the picture gradually, but at last completely. One of the significant historical phenomena in this connection was the decadence of the Hanseatic League in the same period that England was raising herself to commercial supremacy.

The Hanseatic League—a loose federation of North German cities for the promotion of their commerce rather than for political ends stands well nigh unique among socio-political establishments. It seems to have originated with the group of German merchants and traders living in foreign cities. Germans of that period were much more advanced in commerce and industry than any of the other peoples of Northern Europe. Their mercantile houses had a system of sending representatives to foreign cities, where they settled, opened business establishments, and very commonly acquired what amounted to full citizenship rights without, however, forfeiting their citizenship at home. This sort of dual citizenship gave them great advantage. In the 12th and 13th centuries these groups of German merchants in foreign cities organized themselves into Hansas which were not unlike German chambers of commerce. To these Hansas, which existed in many cities scattered over northern and western Europe and even Baltic Russia, charters extending various valuable privileges were granted by the states in which they were set up.

The Hanseatic League

As time passed, these cooperations of German groups abroad led to cooperations among the German cities at home and out of these developed the loose federation that history knows as the Hanseatic League. At the height of its power the League maintained military and naval forces and conducted wars, but always as a group of allies rather than as a federation of political entities. This close cooperation was forced upon the cities because of the weakness of the numerous provincial princes scattered among the many small German states. These political rulers were jealous of each other and far from friendly to the Hanseatic League; while their loyalty to the Holy Roman Empire was extremely vague. So, at the height of its power the League, although hardly in any sense a political affair, was nevertheless the most effective centralization of anything like authority in all the German lands.

In general, the aim of the League was to extend the Hanse commercial power as widely as possible abroad, while excluding foreigners from the commercial privileges of the Hanse towns. That it should have succeeded so well and so long in this unilateral program is an astonishing circumstance. That the League did not ultimately bring about an effective unification of Germany seems to have been due chiefly to the antagonisms among the German princes and the

IV—Dictated Economies; Yesterday, Today and Tomorrow

By JOHN H. VAN DEVENTER

jealousies which so many of them entertained against the League.

Because there was no strong central government to back it up, the League could not maintain itself against the strong governments that were growing up in neighboring countries, and gradually it disintegrated. Yet its decadence was so slow that it was not until 1852 that the Hanse Exchange Building in London was sold, while at Antwerp a like melancholy transaction took place in 1863.

Dictated Economy in France

Of all European statesmen, the one who most closely identified himself with the institutions of mercantilism was probably Colbert, the great minister of Louis XIV. He was a contemporary of the earlier Stuart monarchs, and of Cromwell, in England; a real statesman, to whom much of the glory and also much of the ignominy of the Grand Monarch's reign was attributable. His ambition was to make and keep France the first state of Europe; and this he pursued with unflagging energy and utter ruthlessness.

Like all statesmen who pursued a definite policy of mercantilism, he sought to bring every commercial and industrial interest into subordination to the state. To him, only the state, the king, and the ruling few who dominated the court, really counted; the people were the instruments, the raw material, the cannon fodder, whose sacrifice counted for nothing if it would contribute to the power and glory of the state. And like most of the mercantilists, he had the fatally mistaken idea that the power and glory of the state could not be maintained without demanding this sacrifice.

Yet with all his ruthlessness, Colbert conceived himself a reformer and in many ways he was an efficient one. He found a completely rotten and corrupt state of finances, with half the revenue being stolen; and in this regard he greatly improved conditions. He gave every encouragement to the expansion of commerce, granted monopolies in charters of privilege, patronized invention and set up new industries. In order to give French products a better name in foreign markets, he set up a rigid system of specifications for all manufactured articles, with close inspections to insure compliance. He cracked down on offenders in approved present day style, imposing all the penalties that have been threatened, and occasionally imposed, under the Blue Eagle. Unfortunately, like other economic dictators, he over-played his hand; production and products were so standardized, and qualities so rigidly fixed, that it was impossible to turn out many things that the trade wanted and would gladly have accepted. Particular associations, corporations, and municipalities were given exclusive rights in various departments of industry and trade, precisely as under the mercantilist regime had been done in England. All this soon atrophied enterprise, initiative and improvement. Determined to build up prosperous colonies, of which France had at the time a vast extent, he so monopolized their trade and restricted their freedom that results were just the opposite of what he had hoped. The excesses of Colbertism had much to do with the breakdown of French colonial policy and the ultimate loss of the French colonial empire.

Price Fixing in France

The body politic and the body economic of Europe was still contaminated with the germ of mercantilism when the French revolutionary period opened. By this time England had made considerable progress toward emergence from the shadow of this disastrous system; it was edging its way into the early periods of the industrial age. But France, less progressive, was still willing to play with economic dictation and, particularly, clung to the idea that price fixing had some magical power to bring about the semblance of plenty when there was only the fact of scarcity. Indeed, during the revolution and the Napoleonic era all manner of experiments with price fixing and with the control of production were made throughout the countries of Europe. Their chief usefulness was in demonstrating their utter uselessness. When the revolution had brought chaos to French agriculture, industry and commerce, resort was had to the most drastic schemes of dictating prices. Scarcity had forced them up, and the economic dictators undertook to drive them down. Schedules of prices of necessaries were prepared and required to

be posted at shops, just as gasoline prices and taxes are nowadays required to be posted. A graphic picture of the regulatory scheme and of how utterly it failed to produce desired results may be quoted from Henry E. Bourne, writing in the *Journal of Political Economy* in 1919. Here are some excerpts from his story.

> The first effects of the posting of prices had been a great rush to the shops. Many articles could be had at half or a third of their previous price. It was bargain day in Paris and all over France, a dazzling opportunity to exchange paper for goods, food, clothing, and all the necessaries of life. While the law was still new the shopkeepers did not dare to violate it openly. To conceal their goods was to be guilty of hoarding. At Paris they either took their chances with the guillotine or sold out with astounding rapidity. A city councilor complained that within two hours of the promulgation of the prices grocers said they were out of sugar. Many shops closed altogether; others when their shelves were bare did not renew their stock. Some went through the form of bankruptcy to deceive the vigilant eye of local committeemen. At Peronne, writes our English lady, "the shopkeepers secreted as many of their goods as they could; and, when the day arrived, the people laid siege to them in crowds, some buying at the maximum, others less ceremonious, and in a few hours little remained in the shops beyond the fixtures." . . .
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> "It was the honest merchant who became the victim of the law. His less scrupulous compeer refused to succumb. The butcher in weighing meats added more scraps than before, *rejouissances* these were called with delicate irony. . . . The common people complained that they were buying pear juice for wine, the oil of poppies for olive oil, ashes for pepper, and starch for sugar.
>
> ". . . The towns, and especially Paris, were infested with petty traders, who were called *revendeurs* or *marcandiers*, a name which does not seem equivalent to our word huckster, because they did not cry their wares; they were anxious to escape attention. . . . dealt in meat and many of them were butchers' employees who deserted their shops and sold on the corners of the streets or carried it to the doors of apartments. . . . These carried on a contraband trade.
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> "If the maximum laws were meant to save the common people from want and wretchedness, they failed. The scarcity in 1794 was most severe in the supplies of meat, wood, charcoal, pit-coal, and candles. As the days grew shorter in the fall, long lines of men and women would stand in front of the shops where candles were sold. Sometimes the women would fight for preference, because if they could not obtain a supply their husbands would be forced to stop work too early. The same reason brought crowds to the quays where wood and coal were sold. The police reported that often a thousand persons waited all night for the gates to open. Fifty or sixty soldiers were required to keep them in line. . . . It was almost as difficult to obtain a little meat. In March one police observer reported that one hundred and fifty women had crowded up to a butcher's door at four o'clock in the morning. They screamed out that it was better to pay twenty or thirty sous and have what they wanted than to pay fourteen, the maximum price, and get nothing. . . . To clear the path in front of stalls the gendarmes would ride their horses through the crowd or great porters would use their shoulders in a flying wedge. Women would stand in line for hours shivering with the cold, only to be told when their turn came that nothing was left."
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> ". . . The effect (of the price fixing laws) was bound to be temporary, because a system of force is ill adapted to the normal activities of mankind. As Roland, the Girondin Minister of the Interior had said, 'Once begun, it must be employed continuously, while its use aggravates the need, until soon half the nation must be armed against the other half.' . . . the watchward was coercion, terror. The Government had nothing to substitute for the old mechanism of industry and trade *except floods of circulars and hordes of agents and place-fillers.*"

Medieval Price Fixing: Holland and Belgium

John Fiske, in "The Unseen World and Other Essays," tells of the efforts in the Low Countries, in the 15th and 16th centuries, to enforce Government prices as against the monopolies of which the public complained. Here is his description of the experience:

. . . ."This disastrous piece of legislation was due to the universal prevalence of a prejudice from which so-called enlightened communities are not yet wholly free. It is even now customary to heap abuse upon those persons who in a season of scarcity, when prices are rapidly rising, buy up the 'necessaries of life,' thereby still increasing for a time the cost of living. Such persons are commonly assailed with specious generalities to the effect that they are enemies of society. People whose only ideas are 'normal ideas' regard them as heartless sharpers who fatten upon the misery of their fellow creatures. And it is sometimes hinted that such 'practices' ought to be stopped by legislation.

"Now, so far is this prejudice, which is a very old one, from being justified by facts, that, instead of being an evil, speculation in breadstuffs and other necessaries is one of the chief agencies by which in modern times and civilized countries a real famine is rendered almost impossible. This natural monopoly operates in two ways. In the first place, by raising prices, it checks consumption, putting every one on shorter allowance until the season of scarcity is over and thus prevents the scarcity from growing into famine. In the second place, by raising prices, it stimulates importation from those localities where abundance reigns and prices are low. It thus in the long run does much to equalize the pressure of a time of dearth and diminish those extreme oscillations of prices which interfere with the even, healthy course of trade. A government which, in a season of high prices, does anything to check such speculation, acts about as sagely as the skipper of a wrecked vessel who should refuse to put his crew upon half rations.

"The turning point of the great Dutch Revolution (about 1584), so far as it concerned the provinces which now constitute Belgium, was the famous siege and capture of Antwerp by Alexander Farnese, Duke of Parma. The siege was a long one, and the resistance obstinate, and the city would probably not have been captured if famine had not come to the assistance of the besiegers. It is interesting, therefore, to inquire what steps the civic authorities had taken to prevent such a calamity. They knew that the struggle before them was likely to be the life-and-death struggle of the Southern Netherlands; they knew there was risk of their being surrounded so that relief from without would be impossible; they knew that their assailant was one of the most astute and unconquerable of men, by far the greatest general of the 16th century. Finding that sundry speculators were accumulating and hoarding up provisions in anticipation of a season of high prices, they hastily decided, first of all to put a stop to such 'selfish iniquity.' In their eyes the great thing to be done was to make things cheap. They therefore affixed a very low maximum price to everything which could be eaten, and prescribed severe penalties for all who should attempt to take more than the sum by law decreed. If a baker refused to sell his bread for a price which would have been adequate only in a time of great plenty, his shop was to be broken open, and his loaves distributed among the populace. The consequences of this idiotic policy were twofold.

Low Prices, But Nothing for Sale

"In the first place, the enforced lowness of prices prevented any breadstuffs or other provisions from being brought into the city. It was a long time before Farnese succeeded in so blockading the Scheldt as to prevent ships laden with eatables from coming in below. Corn and preserved meats might have been hurried by thousands of tons into the beleaguered city. Friendly Dutch vessels, freighted with

abundance, were waiting at the mouth of the river. But all to no purpose. No merchant would expose his valuable ship, with its cargo, to the risk of being sunk by Farnese's batteries, merely for the sake of finding a market no better than a hundred others which could be entered without incurring danger. No doubt if the merchants of Holland had followed out the maxim *Vivre pour autrui*, they would have braved ruin and destruction rather than behold their neighbors of Antwerp enslaved. No doubt if they could have risen to a broad philosophic view of the future interests of the Netherlands, they would have seen that Antwerp must be saved, no matter if some of them were to lose money by it. But men do not yet sacrifice themselves for their fellows, nor do they as a rule look far beyond the present moment and its emergencies. And the business of government is to legislate for men as they are, not as it is supposed they ought to be. If provisions had brought a high price in Antwerp, they would have been carried thither. As it was, the city, by its own stupidity, blockaded itself far more effectually than Farnese could have done it.

No Incentive to Economize

"In the second place, the enforced lowness of prices prevented any general retrenchment on the part of the citizens. Nobody felt it necessary to economize. Every one bought as much bread, and ate it as freely, as if the government by insuring its cheapness had insured its abundance. So the city lived in high spirits and in gleeful defiance of its besiegers, until all at once provisions gave out, and the government had to step in again to palliate the distress which it had wrought. It constituted itself quartermaster-general to the community, and doled out stinted rations alike to rich and poor, with that stern democratic impartiality peculiar to times of mortal peril. But this served only, like most artificial palliatives, to lengthen out the misery. At the time of the surrender, not a loaf of bread could be obtained for love or money.

"In this way a bungling act of legislation helped to decide for the worse a campaign which involved the territorial integrity and future welfare of what might have become a great nation performing a valuable function in the system of European communities."

Price Fixing and Germany's Economic Collapse

As the details have been drawn into our picture of the world war epoch, it has become generally recognized that Germany's collapse at the end of 1918 was brought about more by economic than by military weakness. From the time of Bismarck, Germany had been the happy hunting ground of economic dictatorship. The German people, traditionally submissive to authority, were probably more amenable than any other great community would have been; but even they had their morale broken by the war-time excesses of economic planning.

THIS is the fourth and the concluding article in the series which has reviewed the record of attempted economic planning through some 5000 years of world history. In Ancient China and Rome, in Greece and Egypt of the early days; later in England of the middle ages, we have seen the costly and unsuccessful attempts that have been made to supplant the law of supply and demand by economic dictatorship. Such attempts have not been ineffectual, for they have led, almost invariably, first to the impoverishment of the masses and then to the decadence and downfall of the nations indulging in this costly experimentation. In no case is there recorded one iota of hope, based upon experience, for those who so enthusiastically but unwisely pursue these intriguing but deadly economic will-o-the-wisps.

If we are to profit by experience, America will not lightly trade its heritage of initiative, independence and unexampled progress for a pedagogic and poisonous mess of socialistic pottage.

By the time the war had lasted a year, and at a period when the military situation still seemed to justify German hopes of victory, the beginnings of economic disintegration were already apparent. John Hilton, in an article entitled "Germany's Food Problem and Its 'Kontrolle,'" in the *19th Century* magazine for January, 1916, pictured the situation that was developing from the ill advised measures of the price dictators. In part he wrote:

> "the Federal Council issued an ordinance authorizing the establishment of maximum retail prices for food and fodder-stuffs, as well as all other articles of daily consumption, by local authorities throughout the Empire. The local police were to close the business premises of persons acting contrary to the regulations, and the sale of their goods was to be completed by the authorities; whilst any person secreting supplies of commodities for which maximum prices had been fixed was to be punished by heavy fine or imprisonment.
>
> "It is hardly believable that a policy so momentous, a policy which every student of economic history knows to entail the most far-reaching consequences, could have been adopted without due consideration either of its relevance to the problem confronting the nation or of the reactions that were likely to occur. Yet all the evidence points to that conclusion. It shows the maximum-price policy, in its origin, to have been no more than a piece of the most off-hand expediency. Despite the German reputation for foresight and organization it is quite obvious that the Government had no considered plan of action ready for the emergency, and, indeed, that no competent person of any weight in the counsels of State had given the question serious thought: for their appears to have been no one to point out that high prices were a natural deterrent, harsh but effective, to consumption, and at the same time a powerful incentive to increased production, and that the enforcement of artificially low prices would tend to defeat both these vitally important ends.
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> "The indignation of the public at the increase in prices arose not so much from the fact that it had to pay more for its goods as that it believed the rise was due solely to the unpatriotic greed of 'food usurers' who were using the national extremity to line their own pockets. This is the burden of every protest and complaint, whether from individuals, societies or administrative bodies, and of the preamble to many a maximum-price schedule: . . . Blame was distributed freely and indiscriminately upon retailers, dealers, speculators, and monopolists, but in truth the increase did not originate with them; its origin went much deeper down to the essential relation of prices to supply and demand. The rise and fall of prices are in part a means whereby an overbalance of supply or demand corrects itself. In this case the balance had been most violently disturbed by the sudden curtailment of supplies, and in consequence a strong tendency had been set up for prices to rise. . . . In so far as the repression of 'profiteering' was their object, maximum prices were not likely to prove effective.
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> ". . . no sooner did the maximum prices make their appearance than evasion began.
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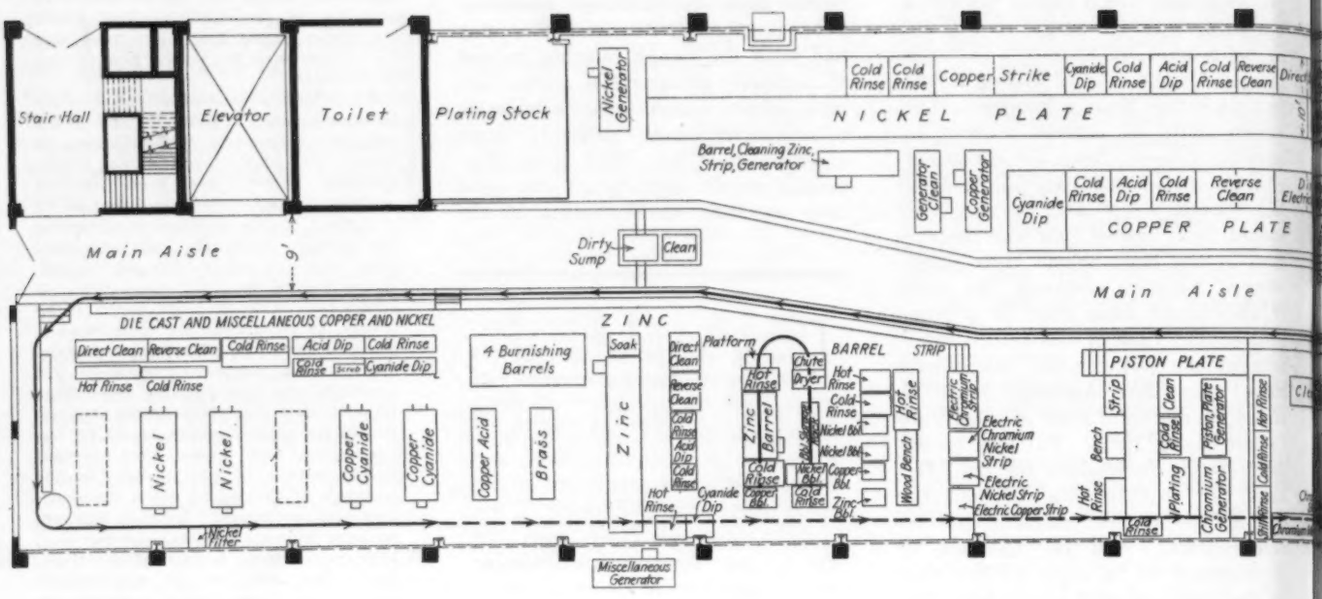
> "The conclusion to be drawn from the German experiment in the State control of food prices is not that maximum prices must inevitably fail in all circumstances. (It is not impossible to improve the working of a complex machine that has suffered a severe shock by inserting a crowbar among the wheels.) All that can be definitely asserted is that in this outstanding instance Germany, The Organized State *par excellence*, showed itself unable to make maximum prices work to any sort of national advantage. It seems probable that if the Government had left the food situation to take care of itself, relying on high prices to compel economy and stimu-

(Concluded on Page 68)



Plating Parts at P

PACKARD has recently removed centralized location and added production and enhances the describes the revamped department developed process and quality The authors likewise give a brief dating back

AS part of its expansion program, Packard recently has completed removal of its plating department to a more central location and has added equipment which greatly increases production and enhances the quality of the work.

Packard has plated parts for many years according to standardized rules which have had as their aim the production of plating work of uniformly good quality. A brief review of Packard's experience in the plating field during the past 21 years will give one a better understanding of what is being done today in connection with the plating of more than 1500 different parts.

During the early era of motor cars, our radiators, headlamps, and other exterior parts were made of brass. However, some of the smaller parts were of steel. The steel parts were first copper plated and then brass plated to match other fittings on the car.

In 1903 we purchased equipment and began brass plating as a standard procedure in production. There was a small demand for black nickel plating in those early days and a tank was installed for this type of plating. It is notable that our first plating tanks were made from ordinary wooden barrels. The volume of plated parts steadily increased, and in a short time the barrels were replaced with wood tanks.

Brass continued in vogue until 1915, although during this period there was some demand for nickel-plated bolts, nuts, and other small parts in white (not buffed), and a small pitch-lined wood tank was installed for white nickel plating.

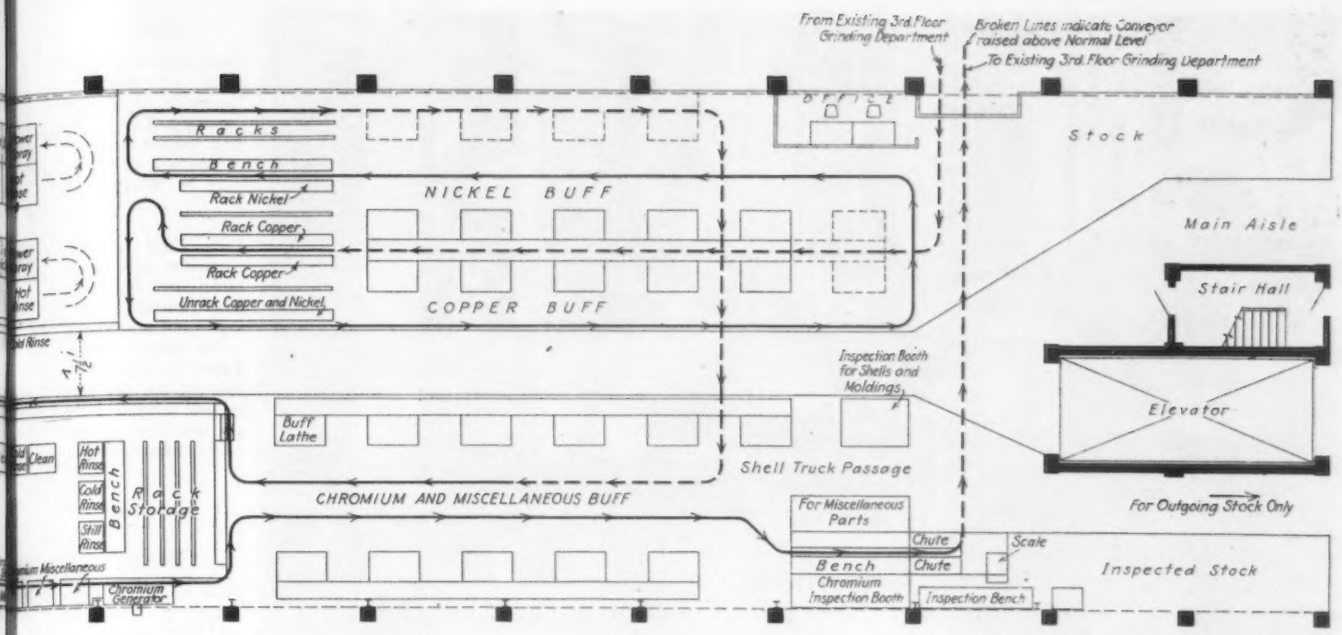
From 1915 to 1922 most exterior parts on automobiles were either black enameled or painted. In 1922 Packard standardized on nickel-plated steel radiator shells, headlamps, and various other exterior and interior parts. A 1500-gal. semi-automatic nickel plating tank and two 600-gal. still-copper tanks were installed to handle the increased production. In addition to the semi-automatic tank there were also two smaller nickel tanks and one brass tank.

The demand for nickel-plated parts continued to increase to such an extent that in 1927 a 12,000-gal. lead-lined nickel tank and a 5000-gal. steel copper tank were installed. Each unit was of the full automatic type. In 1928 chromium plating over nickel on exterior parts was adopted as standard on Packard cars, and a unit was installed for this additional plating. This unit consisted of nine separate plating tanks (lead-lined) and other necessary equipment, such as generators, rheostats, thermostats, timing clocks, cleaning tanks, etc. We are still using this unit with a few minor modifications.

As part of its plan of expansion, the Packard Company has recently completed removal of the plating department to a more centralized location. New equipment has been provided and the department divided into nine separate units as follows:

1—Polishing
2—Automatic copper and nickel plating
3—Chromium plating.
4—Nickel plating of die castings
5—Zinc plating
6—Barrel Plating
7—Buffing
8—Burnishing
9—Inspection

Parts are polished on the floor above the plating department and



Packard ▲ ▲ ▲

By W. H. GRAVES and J. W. HIGGINS
Packard Motor Car Co.

its plating department to a more equipment which greatly increases quality of the work. This article and relates how Packard has specifications for all plated parts. history of plating work at Packard to 1903.

transported to the department on an overhead monorail chain-type conveyor. This conveyor system, 1000 ft. long, goes to all parts of the department and speeds up greatly the handling of parts which were formerly trucked into the department in pans.

A 16,000-gal. rubber-lined nickel tank is included in the automatic lineup. The quality and appearance of plated parts and the efficiency of the department have been enhanced by the use of new generators, more modern heating units and numerous other changes.

Since we did not wish even a trace of free fumes in the department, we installed a high suction vent system which carries away all fumes. This system uses 300,000 cu. ft. of air per min., or 300 cu. ft. per min. per sq. ft. of tank area. Vent hoods for each tank are designed compactly to avoid interference with work to be plated. They are made of 14-gage welded steel sheets, coated with acid-resisting paint inside and outside. Over this paint on the outside is a coat of aluminum paint.

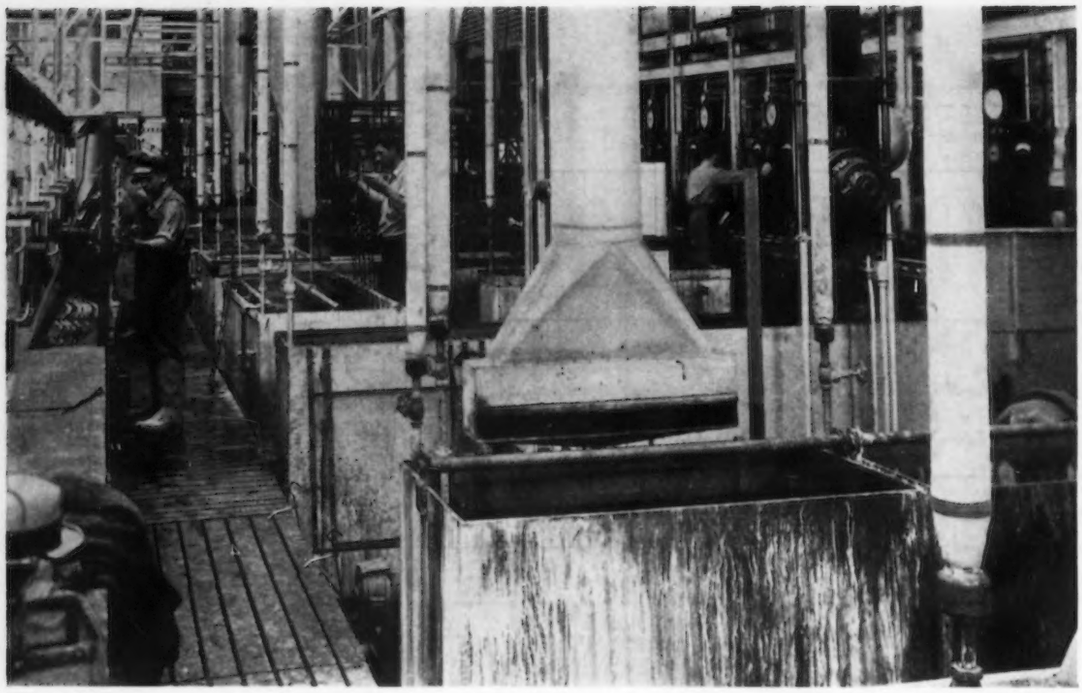
Every possible precaution was taken to insulate the tanks against cross currents. All tanks are set on insulators and all piping and exhaust ducts are insulated.

The dust arrester system in connection with the buffing machines uses 800 cu. ft. of air per min. per wheel. To secure the maximum benefit from the air suction, Venturi nozzles have been installed at the end of each arrester so that the velocity suction is reconverted into static suction. Special effort has been exerted to make working conditions within the department as pleasant as possible. The floor area gives the workmen adequate space to move about, and natural light is provided by skylights.

The heating of the nickel solution is accomplished by means of a lead coil heater, which has a heating capacity of 4000-gal. per hr. The plating solution passes first through a continuous-type filter press and is then pumped under pressure through the coils of the heating unit, after which it is carried into the nickel tank through a perforated lead pipe. This procedure, of course, is continuous day and night. The temperature of all plating baths is controlled by thermal-actuated steam valves.

The writing of specifications at Packard began in 1924. The first one was a process specification outlining in detail the various steps to be taken in the polishing and plating of parts in our own plant. This specification really acts as a guide for the plating department and is invaluable in many ways. We have always put unusual stress on the polishing of parts to be plated, the current density used in the plating operation, and the length of time in the plating bath. Results obtained from research, exposure tests, etc., have required changes in specifications from time to time. A typical process specification for one of the plating units is printed with this article.

In 1926 the Packard company began writing specifications covering the quality of parts plated by outside suppliers. The first one required a minimum of 425 amp. min. of copper, 325 amp. min. of nickel per sq. ft. and a 24-hr. salt spray test without showing any sign of rust. It is interesting to note, in passing, that our present process specification requires a mini-



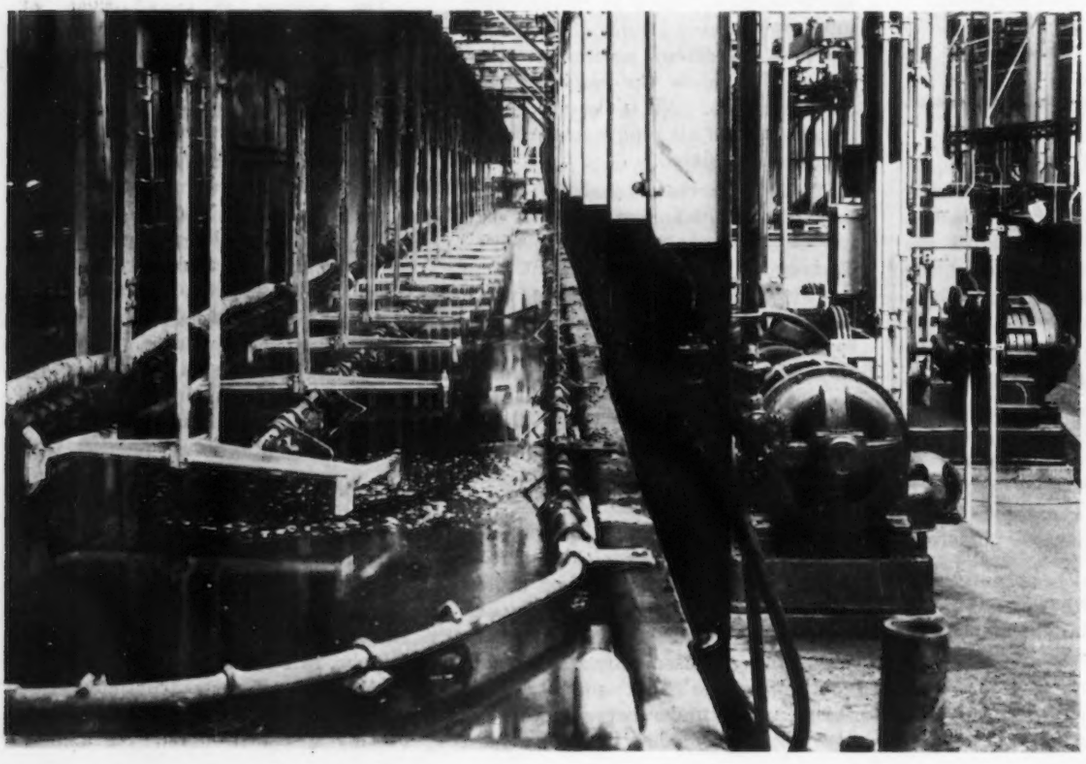
Parts come to the chromium plating tanks on an overhead monorail conveyor and are dipped in the tanks by hand. Tanks are set on insulators and all piping and exhaust ducts are insulated to prevent cross currents.

mum of 250 amp. min. of copper and 750 amp. min. of nickel per sq. ft.

For a period of two years prior to 1930, a careful study was made of various plated parts which had failed on exposure and of parts which had stood up under the same test. The amount of plate was noted and a serious effort made to standardize on the amount of plate necessary to withstand severe outdoor exposure.

The results obtained from this study convinced us that any plated part on the exterior of a motor car must have a minimum amount of total plate specified. We accordingly changed our quality specification, discarded the salt spray test and incorporated a requirement of not less than 14 grams total plate (copper and nickel) per sq. ft., with 7 grams of each metal as the most desirable combination. However, further tests and research have shown that copper is not as important as nickel on exposure, and we have therefore changed our requirements to 3 grams of copper and 11 grams of nickel per sq. ft., or 0.00075 in. of total plate thickness.

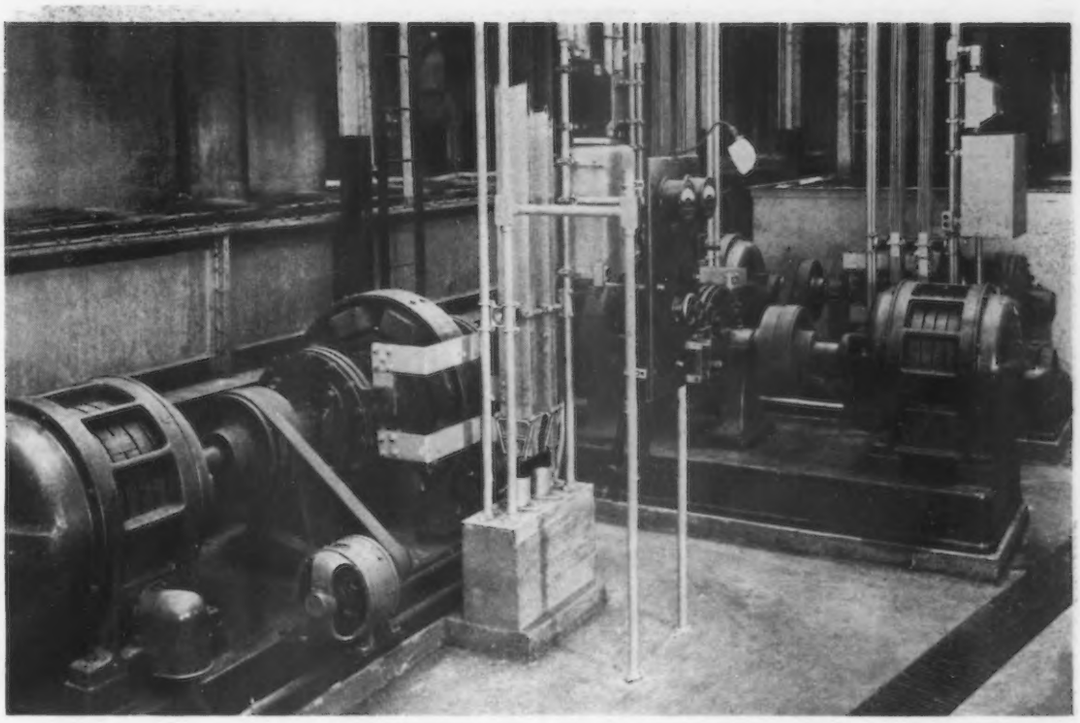
The use of plated zinc base die castings has been increasing rapidly for such parts as door handles, radiator caps, etc., and it became necessary to write a quality specification for plating this metal. We had a specification for non-ferrous metals



Parts are nickel plated automatically in a 15,600-gal. rubber-lined tank. The overhead conveyor is of the standard monorail chain type. A high suction ventilating system removes fumes from the plating tanks. Vent hoods are compactly built so as to avoid interference with plating tanks.

AT RIGHT

Separate generators are used for each class of cleaning. Here are the generators for copper and nickel plating.



BELOW

Packard has a unit consisting of two copper tanks and two nickel tanks devoted exclusively to plating zinc base metals.

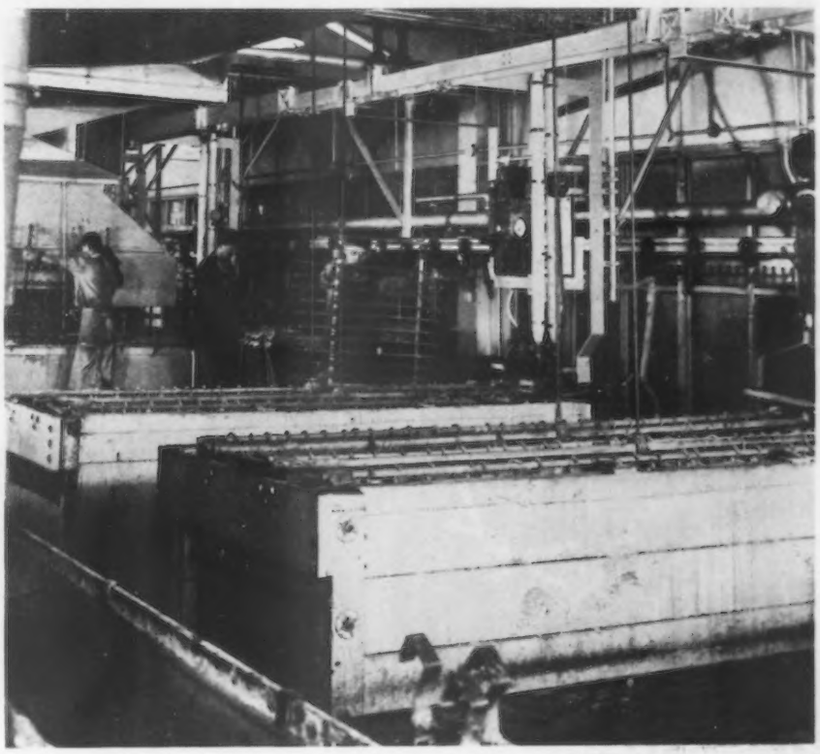
(brass) and decided to adopt it for die castings. This specification, which named a minimum of 5 grams of nickel per sq. ft., did not achieve the desired results, so we increased the amount of nickel plate to a minimum of 10 grams per sq. ft. Although this amount of nickel on die castings greatly reduced failures in the field, we did have some cases of nickel cracking or checking, which is common to heavy nickel deposits on die castings. As a result of recent tests, we have added a minimum of 4 grams per sq. ft. of copper to be plated directly on the die casting and a minimum of 10 grams of nickel per sq. ft. to be plated over the copper.

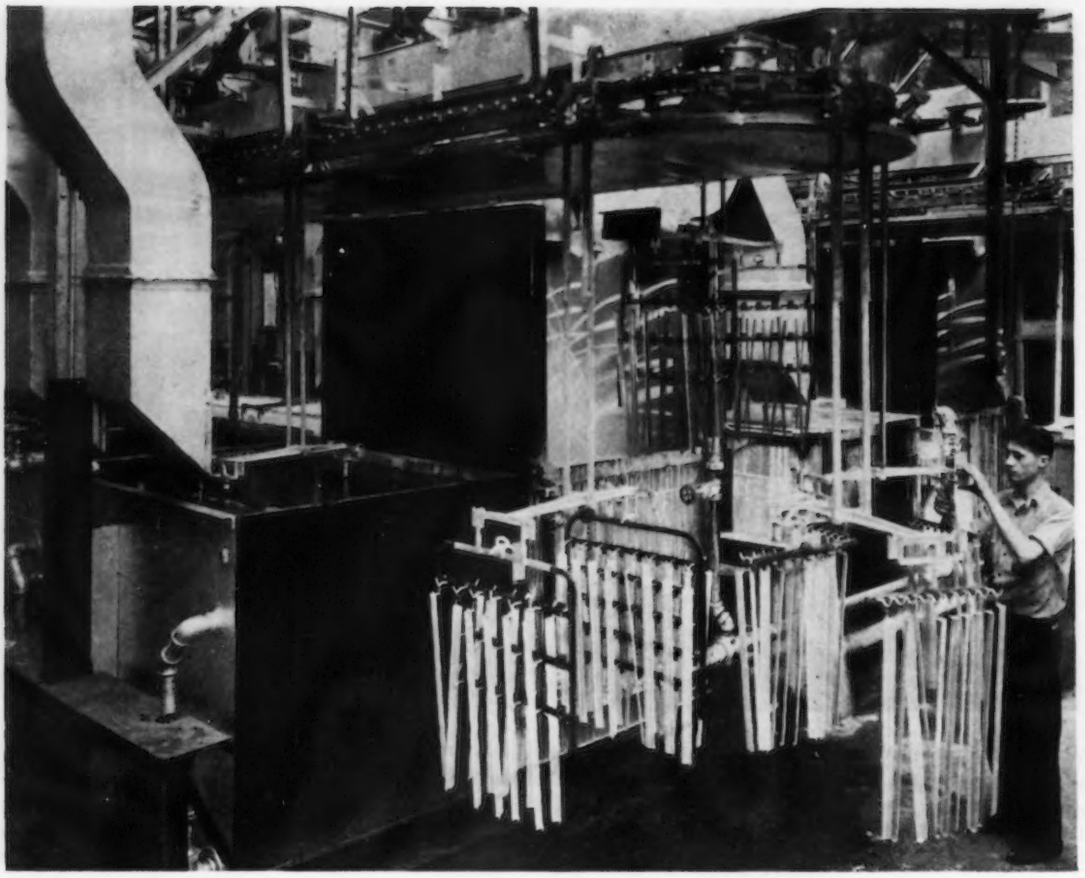
We have at present 18 different quality specifications for various types of electro-plating as follows:

1. Nickel plating on steel (exterior use).
2. Bright nickel plating for small steel and copper parts.
3. Nickel plating on steel of large exterior parts.
4. Bright nickel plating of small steel parts.
5. Nickel plating on brass.
6. Bright nickel plating of non-ferrous parts.
7. Nickel plating of zinc base metals for exterior use.
8. Nickel plating of zinc base metals for interior use.
9. Chromium plating on steel for exterior use.
10. Chromium plating of small steel parts.
11. Chromium plating of stainless steel parts.
12. Chromium plating of brass parts.
13. Chromium plating of non-ferrous small parts.
14. Chromium plating of zinc base metals for severe exposure.
15. Chromium plating of aluminum.
16. Chromium plating of zinc base metals for mild exposure.
17. Zinc plating.
18. Cadmium plating.

Parts plated in the Packard plant, as well as plated parts coming into the Packard factory from outside suppliers, are periodically checked metallographically to determine the amount of plate. Measurement is made by a filar micrometer eye-piece (Bausch & Lomb) in combination with a 4 mm. objective giving a magnification of about 500 diameters. Measurements are taken at two or three places on the sample.

In preparation for the test, the piece should be plated with chromium, if chromium is not already present. A 3 to 5 min. deposit of chromium is sufficient before the sample is cut out by means of a hacksaw or Carborundum cutting wheel. This extra deposit of chromium supports the softer de-





AT LEFT

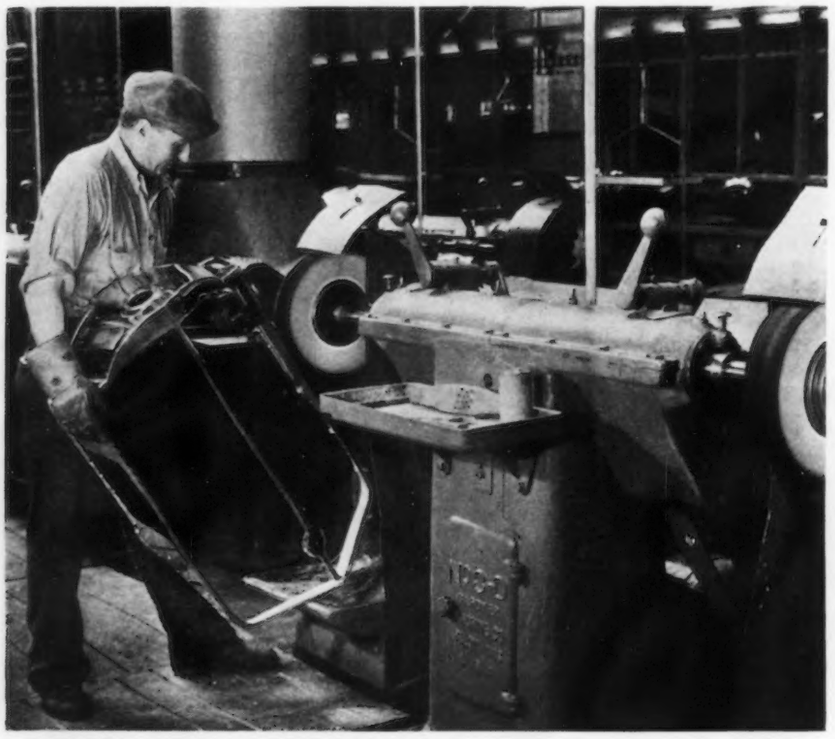
Parts are hung by hand on conveyor to go through the nickel plating operation. Note the power spray cleaner through which parts pass for 1 min.

AT RIGHT

Buffing department with plating department in background. Both departments are free from fumes and dust and have unusual daylight lighting. Dust arresters in connection with buffing machines use 800 cu. ft. of air per min. per wheel.

posits during grinding and polishing. The sample is ground and polished on a series of metallographic papers ending with No. 0000 (Barton), and then polished on cloth-covered wheels using levigated alumina as the abrasive.

When the sample is small or thin or of a shape difficult to hold during polishing, it is held in a simple clamp or is forced into a short piece of brass tubing or nut of suitable diameter. The polished sample is washed in alcohol and etched by being dipped into concentrated nitric acid and quickly washed off in a stream of water.



Radiator shell being buffed prior to chromium plating.

A typical process specification for plating work, as it is employed today in Packard's plating department, is herewith printed.

NICKEL PLATING STEEL

GENERAL:

This specification shall cover the nickel plating of steel parts, such as winterfronts, window ventilator frames, etc.

Individual specifications for each operation are a part of this specification and must be carried out in the following order:

1. Polish.
2. Clean.
3. Copper plate and wash.
4. Clean and copper strike.
5. Nickel plate and wash.
6. Buff.

WORKMANSHIP AND FINISH:

All operations must be carried out in a workmanlike manner and must be free from flaws and defects which would show on the finished product.

POLISHING

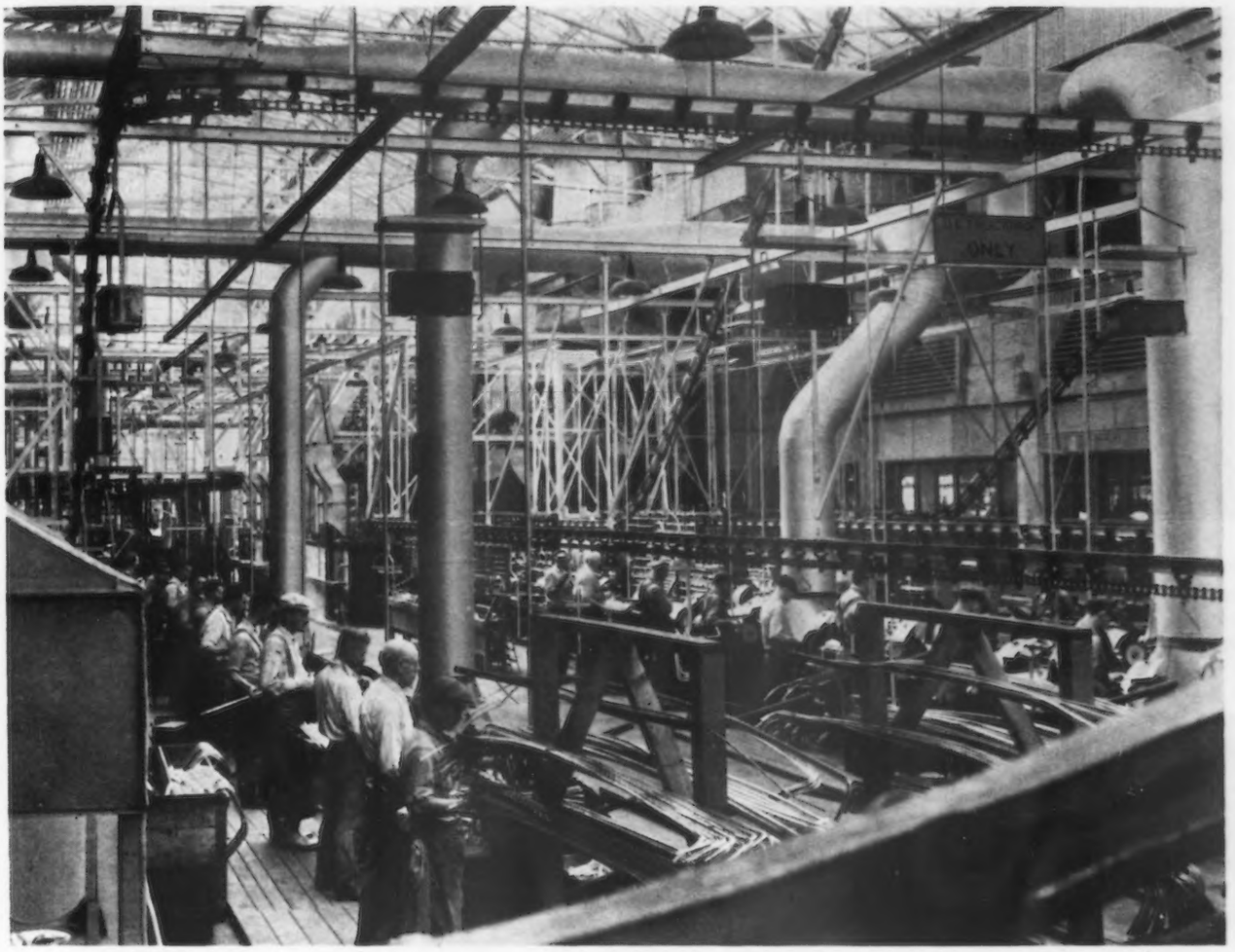
SURFACE CONDITION:

All parts, as received, shall be free from die marks, dents, wrinkles, bad welding scale, and other surface defects.

MATERIAL:

Cloth wheel.

No. 70 Borolon emery.
No. 120 natural emery.
No. 150 artificial emery.
No. 220 artificial emery.
Tripoli metal polish.
Glue B-2—Special joint hyde glue.



PREPARATION OF MATERIAL:

Brush working surface of cloth wheel with a coat of glue. Dry one hour. Recoat with glue and immediately roll in desired emery. Dry 12 hr. Recoat with glue and roll in desired emery. Dry 24 hr.

APPLICATION OF MATERIAL:

Polishing wheels shall revolve at approximately 2000 r.p.m. and each succeeding polishing operation shall completely remove the marks of the preceding polishing wheel.

The direction of the polish shall be:

No. 70 Wheel—Approximately 30 deg. angle with horizontal plane.

No. 120 Wheel—At right angles to the above.

No. 150 Wheel—Approximately 30 deg. angle with horizontal plane.

No. 220 Wheel—At right angles to the above.

REMARKS:

At this point the part shall be free from deep scratches or welding scale, and any defects which would show on the finished part.

CLEANING

SURFACE CONDITION:

The part shall be free from deep polishing scratches, dents, welding scale, and any defects which would show on the finished part.

MATERIAL:

Plater's Cleaner, Specification No. 8-K.
Muriatic Acid (Commercial).
Sodium Cyanide (Commercial).
Tri-Sodium Phosphate (Commercial).
Iron Plates (3 ft. x 6 in. x ¼ in. Anodes).

Munning Automatic Electro-Plating Equipment.

PREPARATION OF MATERIAL:

Mix 2 oz. of tri-sodium phosphate to 1 gal. of water in the 400-gal. power spray tank. Dissolve 6 oz. per gal. of Plater's Cleaner in the 2080-gal. and also in the 1350-gal. steel cleaning tanks. Keep at temperature of 180 to 200 deg. F. The part being cleaned shall act as cathode in the first cleaning tank and as anode in the second cleaning operation. Current density shall be 25 amp. per sq. ft. minimum.

Mix one part of muriatic acid to nine parts of water in the 685-gal. acid dip tank. Keep at room temperature.

Mix 3 oz. of sodium cyanide to 1 gal. of water in the 2320-gal. steel tank. Keep at room temperature.

The strength of the above solutions shall be maintained by the addition of materials as required.

APPLICATION OF MATERIAL:

The part shall be hung on the Munning conveyor. It moves to the power spray for 1 min., is kept in the first alkali cleaning tank for 3 min. and in the second alkali clean for 1½ min. It is dipped in cold running water, then in 10 per cent muriatic acid, then in cold running water. It is dipped in the cyanide solution and conveyed to the copper plating bath. All rinsing tanks are equipped with sprays so that the work is thoroughly rinsed as it leaves the tank.

REMARKS:

The surface of the part shall be chemically clean, free from all traces of dirt and grease, and must not show any break in the water film after the last dip.

COPPER PLATING

SURFACE CONDITION:

The part must be free from dents, dirt, grease marks, and must not show any break in the water film after the last cyanide dip.

MATERIAL:

Copper Cyanide.
Sodium Cyanide.
Sodium Carbonate
Copper Anodes and Hooks (36 in. length), 99 per cent copper, minimum.

PREPARATION OF MATERIAL:

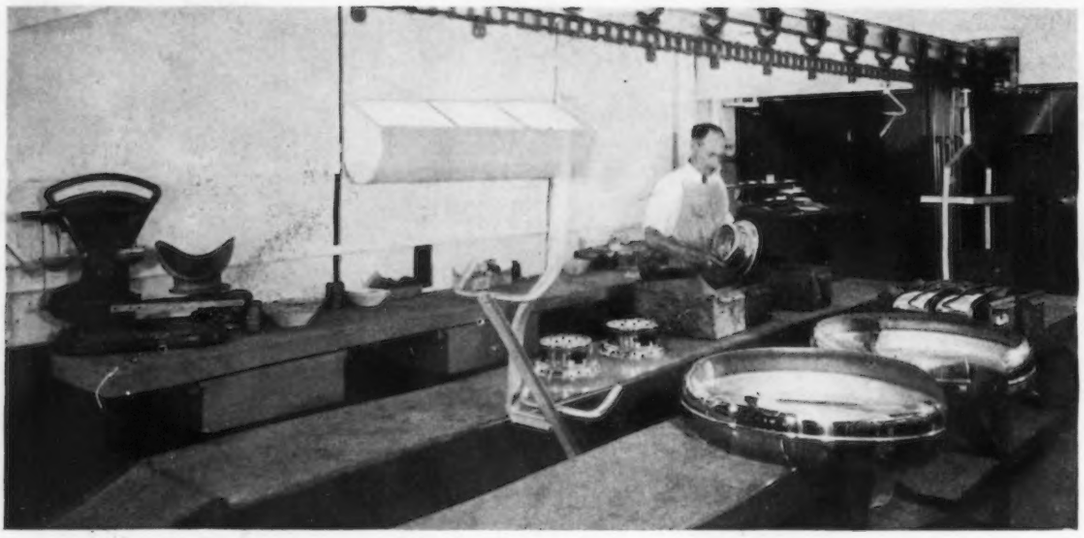
One thousand seven hundred twenty lb. of sodium cyanide shall be dissolved in hot water in a steel tank (capacity 4930 gal). 1509 lb. of copper cyanide is added slowly and the solution stirred until the copper is dissolved. 925 lb. of sodium carbonate is added to the tank and the solution diluted to 4930 gal. The bath is held at a temperature of 120 to 130 deg. F. during plating operation.

APPLICATION OF MATERIAL:

The part hung on copper hooks shall be conveyed and suspended in the copper bath 13 in. from the anode. The part, suspended from the conveyor, shall revolve slowly in the tank for a period of 10 min. A current density of not less than 25 amp. per sq. ft. shall be used for the plating operation.

REMARKS:

Immediately after the part is removed from the plating solution it passes through a cold running water rinsing tank, then in hot water and is air dried. The copper



Final inspection of plated parts which come to inspectors on power conveyors.

deposit must not chip, peel or curl, and must be free from runs and blisters.

The copper plating bath shall at all times contain:

3.0-4.0 oz. Copper (Metal) per gal.
2.5-3.5 oz. Free Sodium Cyanide per gal.
2.0-4.0 oz. Sodium Carbonate per gal.

NICKEL PLATING

SURFACE CONDITION:

The part must be entirely free from grease and dirt, and must not show any break in the water film after the final cold water spray.

MATERIAL:

Single Nickel Salt (Nickel Sulphate).
Sodium Chloride.
Boric Acid.
Nickel Anodes (36 in. length), 99 plus hot rolled-bright annealed-depolarized.
Copper Hooks.
Hydrogen Peroxide (100 Volume).
Steel Tank (Rubber-lined).

PREPARATION OF MATERIAL:

The 15,600-gal. tank shall be half-filled with tap water. 39,000 lb. of Nickel Sulphate and 2432 lb. of Sodium Chloride shall be dissolved in the tank. The tank shall be filled with tap water (15,600 gal.) and 2432 lb. of Boric Acid added. The bath shall be kept at a temperature of 110 to 120 deg. F. The strength of the solution shall be constantly maintained to the limits shown below by the addition of the salts as required. In making additions, the salts shall be placed in a bag and suspended in the plating bath.

APPLICATION OF MATERIAL:

The part to be plated shall be suspended from the conveyor into the plating bath, the face of the part facing the anodes. The distance from the anodes shall be 13 in. The currrent density shall not be less than 25 amp. per sq. ft., and the part, attached to the automatic conveyor, shall be slowly revolved in the plating bath for a period of 30 min.

REMARKS:

Immediately after the plating operation, the part shall be dipped in cold running water, then in hot water and air dried. The acidity of the bath should be between P.H.-5.5—5.9. The acidity may be controlled by adding ammonia or sulphuric acid in small quantities as the case may require. The nickel anodes shall be scrubbed each time the tank is filtered which shall be at regular intervals. Any tendency of the nickel to pit can be controlled by the addition of Hydrogen Peroxide (100 Volume) in small quantities (1/32 oz. per gal.).

The bath at all times shall contain:

35.0-45.0 oz. Nickel Sulphate per gal.
2.0- 3.0 oz. Sodium Chloride per gal.
2.0- 3.0 oz. Boric Acid per gal.
7.0- 9.0 oz. Nickel (Metal) per gal.

CLEANING—COPPER STRIKE

SURFACE CONDITION:

The part at this point must have a good copper deposit which does not chip, peel or curl and must be free from runs and blisters.

MATERIAL:

Plater's Cleaner (Oakite—Rex or Northwest).
Sodium Cyanide (Commercial).
Muriatic Acid (Commercial).
Copper Cyanide (96-98 per cent).
Tri-Sodium Phosphate (Commercial).
Sodium Carbonate (Commercial).
Iron Plates (3 ft. x 6 in. x ¼ in.).

PREPARATION OF MATERIAL:

Two oz. per gal. of tri-sodium phosphate shall be dissolved in the power spray tank. 6 oz. per gal. of Plater's Cleaner shall be dissolved in each of the steel cleaning tanks. The temperature shall be 180 deg.-200 deg. F. The parts being cleaned shall act as cathode in the first cleaning tank, and as anode in the second tank. The minimum current density shall be 20 amp. per sq. ft. in each tank.

Add one part of muriatic acid to nine parts of water in the 685-gal. rubber-lined acid tank. Keep at room temperature.

Dissolve 3 oz. of sodium cyanide to 1 gal. of water in the 730-gal. steel tank. Keep at room temperature. The strength of the above solutions shall be maintained by the regular addition of the materials required.

Four hundred fifty lb. of sodium cyanide shall be dissolved in the 2080-gal. steel copper strike tank. 390 lb. of copper cyanide shall be added and the solution stirred until the copper is dissolved. 325 lb. of sodium carbonate shall also be dissolved in this solution. The temperature of this solution shall be 100 to 120 deg. F.

APPLICATION OF MATERIAL:

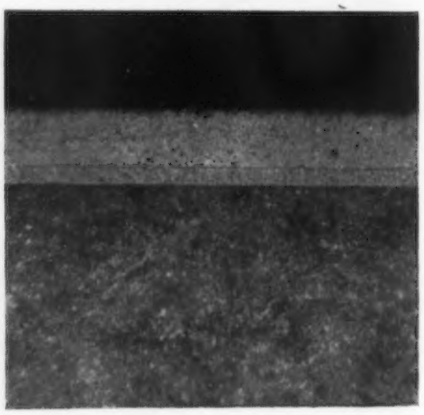
The part, hung on the conveyor, shall pass through the power spray for 1 min.; it then goes to the first electric clean for 3 min. and to the second electric clean for 30 sec. It is rinsed in cold running water, then dipped in the muriatic acid and rinsed in cold running water. It is dipped in the cyanide bath and plated in the copper bath for 3 min. at a current density of 10 amp. per sq. ft. It is then given two successive cold water rinses and then nickel plated. All rinsing tanks in this lineup shall be equipped with sprays.

REMARKS:

The surface of the part must be chemically clean, free from all traces of dirt and grease and must not show any break in the water film after the last rinse.

The copper strike bath at all times shall contain.

3.0-3.5 oz. Copper Cyanide.
1.0-1.5 oz. Sodium Cyanide.
2.0-3.0 oz. Sodium Carbonate.



This photomicrograph is of a nickel-plated zinc base die casting for a door handle. Note the layers of nickel and of copper.

BUFFING—COLORING

SURFACE CONDITION:

The nickel deposit shall be of a fine texture, free from pits, must not chip or peel, and shall show no indication of having a dark or yellowish cast.

MATERIAL:

Cloth Buffing Wheel.
Nickel Coloring Compound.

PREPARATION OF MATERIAL:

The cloth buffing wheel shall be coated as necessary with the polish specified above.

APPLICATION OF MATERIAL:

Buffed with cloth wheel and nickel polish.

REMARKS:

The finished part must be free from pits, dark spots, scratches, grease marks, and must show no indication of having been burned or buffed through.

Horizontal Boring and Facing Machine Raises Work to Cutters

A HORIZONTAL machine for boring and facing automotive rear axle housings common to automotive vehicles has been placed on the market by the Moline Tool Co., Moline, Ill. It is pictured on page 32.

Six spindles in opposed positions of two spindles each, and carrying multiple blade boring and facing cutters, complete three steps of operation—roughing, semi-finishing and finishing.

The spindles at the left are used for the outside of the holes, while the spindles on the right, bore the inside holes. The spindles do not traverse independently, but rather as a unit, by means of a hydraulic pump and cylinders, controlled from a central point at the front of the machine.

The work-carrying fixture is mounted on a swinging (upward) table which pivots on pre-loaded precision bearings, is counterbalanced and hydraulically operated to raise it from the loading position, successively into three working positions. The arc center of this upward swing is identical with the arc center from which the spindles are mounted. Also, the work-holding fixture which mounts on the upward-swinging or pivoting table, indexes at 180 deg. by means of a lever which raises the fixture off its bearing surface on rollers, permitting easy hand indexing to 180 deg. This fixture-rotation accomplishes positioning of the fixture-held work, for both right side and left side spindle-tools on each end of the fixture-held work progressively, through roughing, semi-finishing and finishing operations.

The machine is of extremely heavy design, the weight being approximately 20,000 lb., a weight essential to the support of two massive, opposed slides, gibbed to the column, and designed for carrying each an arm in which are mounted three short, rugged spindles, each of which runs in pre-loaded, anti-friction, oil-seal bearings. It is to be noted that these spindle-carrying arms are opposed, and arch downward toward the work table, from the slides. The overhanging arm in the center of the machine, also arching downward, is provided with locating holes, into which fit opposing plungers for added rigidity in work holding, during boring operations.

The work cycle consists of fixture loading and clamping, after which the swinging table is elevated hydraulically to the roughing position; the work being done by the two lowest spindles. When the roughing is finished, the locating plungers are withdrawn and the swinging table is elevated to the second, semi-finishing, work position, then again to the third or finishing position.

The swing table is then lowered to the loading position, where the work-carrying fixture is indexed 180 deg. (end for end) after which the progressive operations are duplicated. The control valves are conveniently located on the upper side of the center overhanging arm, from which point the timing of the cycle of operations is handled through the valve control of the operating of each two-spindle unit. Power from the motor is transmitted through V-belts, splined shaft, and hardened alloy steel spiral gears, to the spindles. Any moving parts which do not run in oil are lubricated by a single-shot oiling system. The general design is said to be successfully adaptable to a very considerable range of work.

Bending Machine Design Embodies Complete Hydraulic Control

WILLIAMS, WHITE & CO., Moline, Ill., has engineered a new high-speed, hydraulic, universal tube bender, the main table-frame of which is a heavily reinforced semi-steel box-type casting. On page 32 a side view and an end (swinging arm) view, respectively, are shown. The motors, pumps, relief valves and oil reservoir are located low within the base casting.

The cast steel swinging arm or tube puller is fitted with a toggle-operated clamping device which is closed by an angularly attached cylinder. The swinging arm extends through the table, and has a driving gear, rack driven from the main cylinder, attached to the lower end. Through the swinging arm, is a steel shaft, also extending through the base, on the enlarged top of which, the die is supported; a jaw clutch is used for holding the die in bending, and is thrown out for unloading. A gear attached under the lower base casting and operated by a rack and double-acting cylinder, serves for the die return. A cross-clamping device, located on the top of and across the table, is operated by a rack and pinion attached to a double-acting, hydraulic cylinder, and holds for either right or left hand bending. Notches across the table top provide for securely holding the rollers used for backing up the sliding die. A T-slot across the rear end of the table, supports both the arbor operating cylinder and the sliding die cable pull-back; the table is graduated to simplify cylinder setting for changes in radius. This cylinder is double-acting, pushing the arbor into the tube before bending and pulling it out after the bend is made. Pressure gages, convenient to the operator, provide for checking the pressure of each movement, thus permitting conservation of power through the relief valves when possible. Double-acting, hand-operated piston valves control machine operations—valves 1 and 2 operate the clamp, 4 the arbor, 3 the swinging arm, 5 the clutch, 6 the die return. Time required for 180-deg. bend, size 3-U, 5 sec.

An automatic stop located in front of the operating valves, has both limits (180 deg.) set permanently, and extra collars on both sides are adjustable to set the swinging arm at "Stop" for any degree of bend, either right or left, under 180 deg. Hydraulic oil is used. Machines are built in four sizes: 1¼, 2, 3 and 4 U.

Oil-Seal Has Non-Porous Resilient Seal-Ring

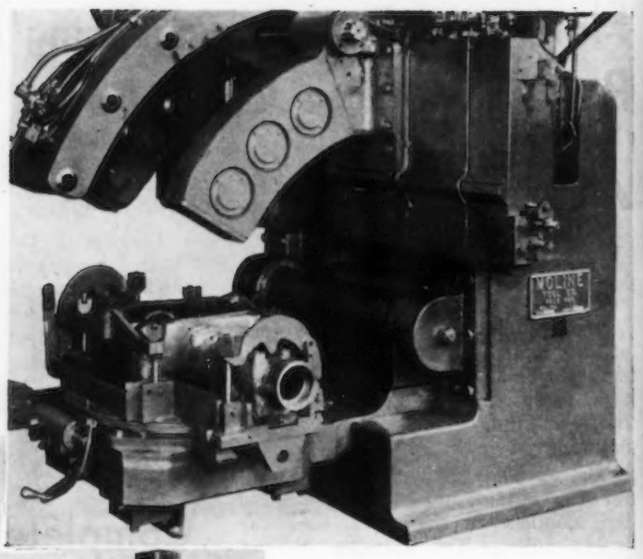
THE Garlock Packing Co., Palmyra, N. Y., announces an improved and patented oil-seal for the retention of bearing lubricant within bearing areas and the exclusion of foreign matter from bearings. This seal, styled the Garlock Klozure, pictured, assembled, on page 32, consists of an adapter, a spreader, a sealing member and the case which houses the several parts and which in assembly is flanged over the adapter ring to effect a unit.

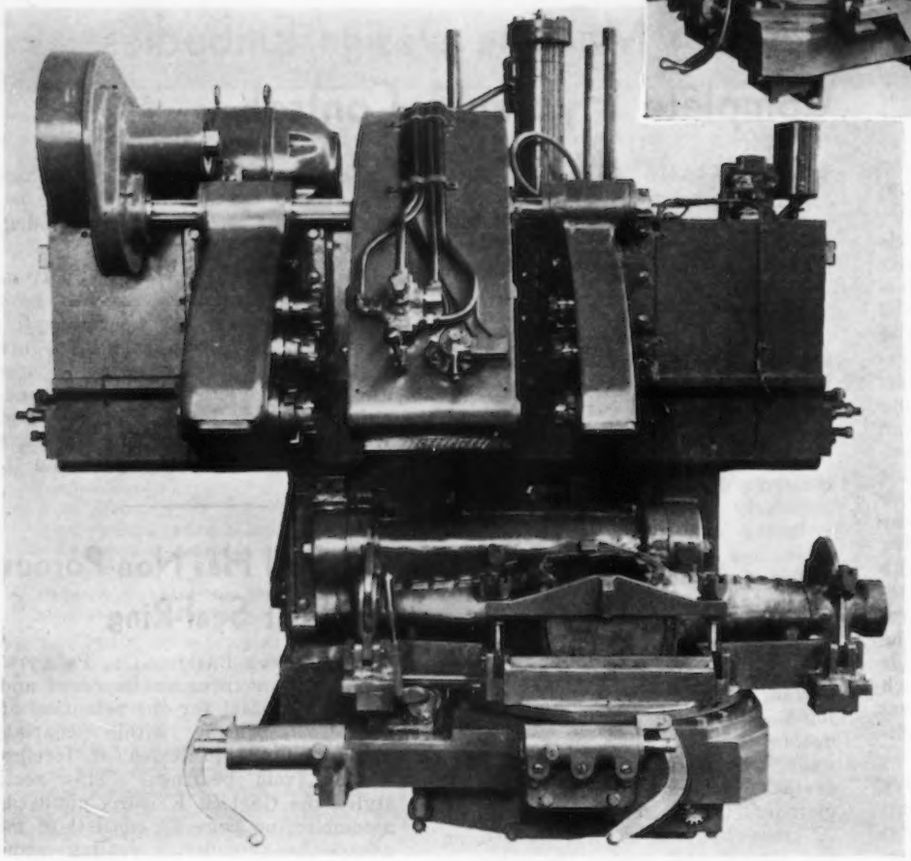
The adapter contacts and exerts pressure upon the spreader. The spreader is a flexible metal ring with V-saw-tooth edges which set into the convex face of the sealing ring but with sufficient play, through a difference in angularity, to cause a uniform pressure upon the lip of the sealing ring, positioned in the sealing member, which pressure, it is said, causes the ring to hug the shaft.

The sealing or packing member is a Garlock product possessing oil resistance and is molded under heat to the exact size of the sealing ring; in form it resembles a modified V. The Klozure is made in standard sizes for shafts ⅜ in. to 3 in. in diameter.

AT LEFT

A MODIFIED "V" shaft-hugging member features this oil-seal, described on page 31.



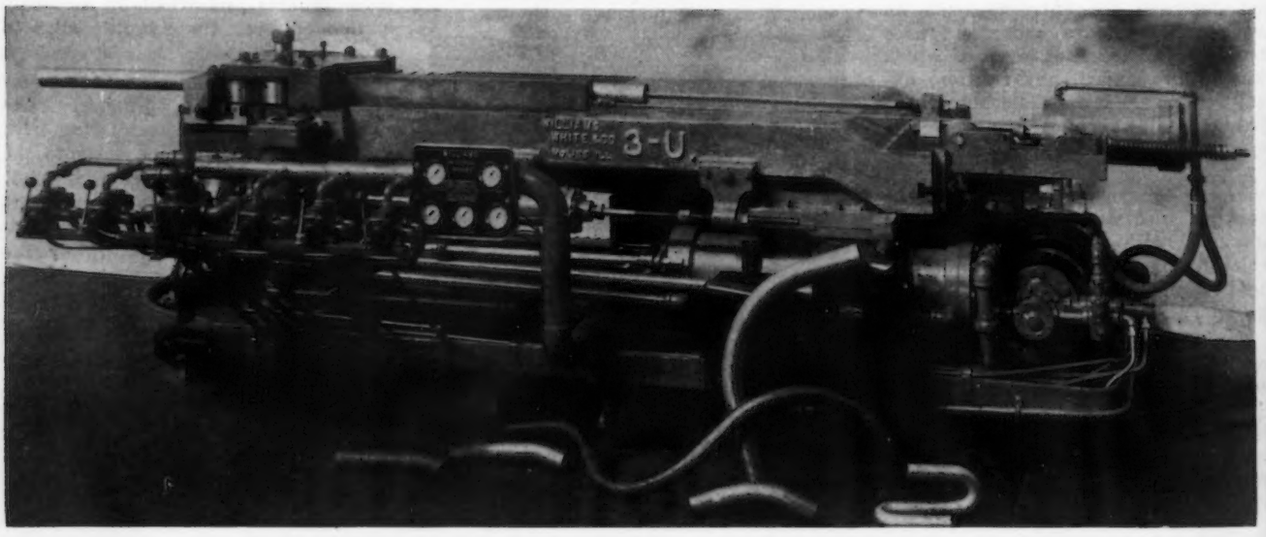


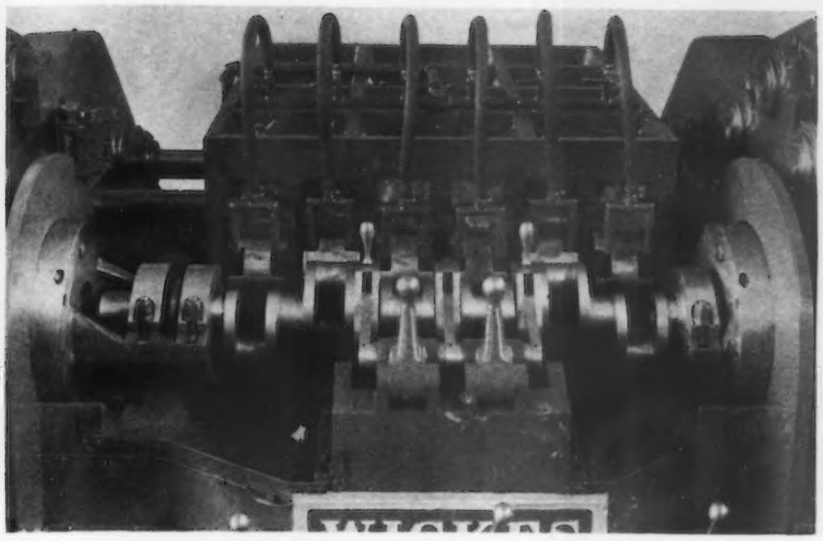
ABOVE AND AT LEFT

UNUSUAL work-handling methods facilitate the boring and facing of automotive axle housings on this Moline horizontal boring machine. Details are given on page 31.

BELOW

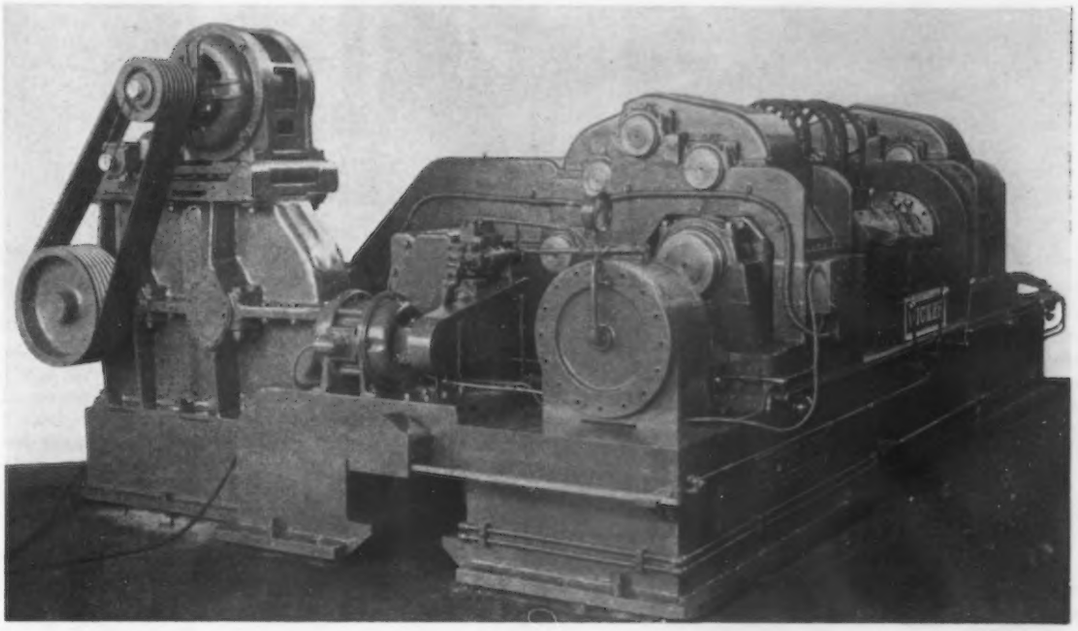
VALVE operating of the hydraulic bending machine, shown at the bottom of this and the opposite page, is covered in the machine description on page 31.





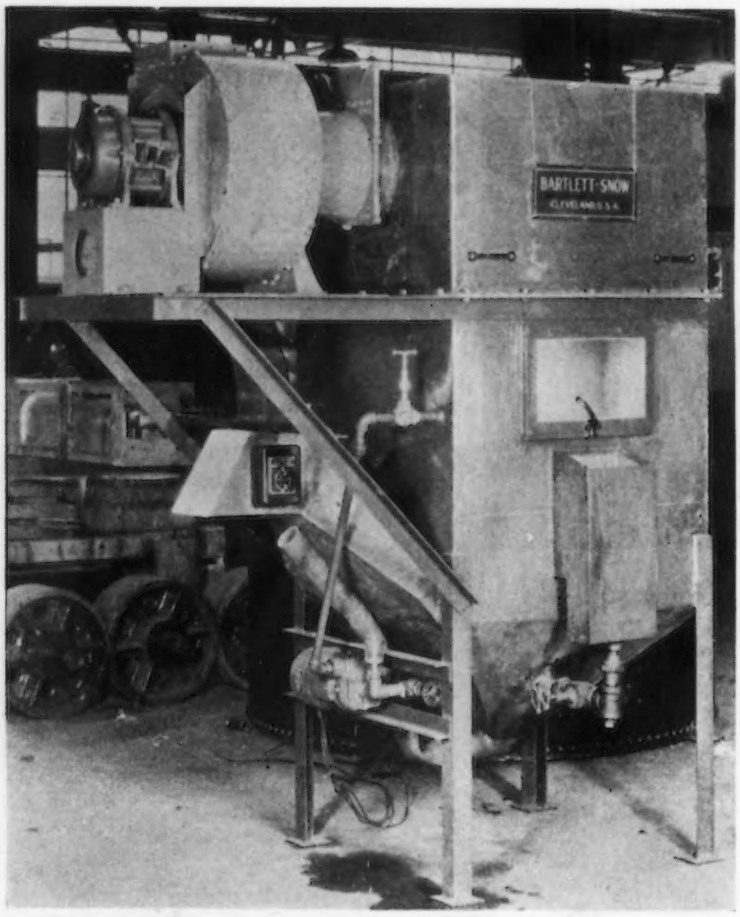
ABOVE AND AT RIGHT

DESIGNED for crank-arm contour turning, this 62,000-lb. lathe provides the necessary metal for rigidity and the means for adequate work-support. The machine is driven by a 30-hp. motor, through a reduction unit. The description is on page 35.

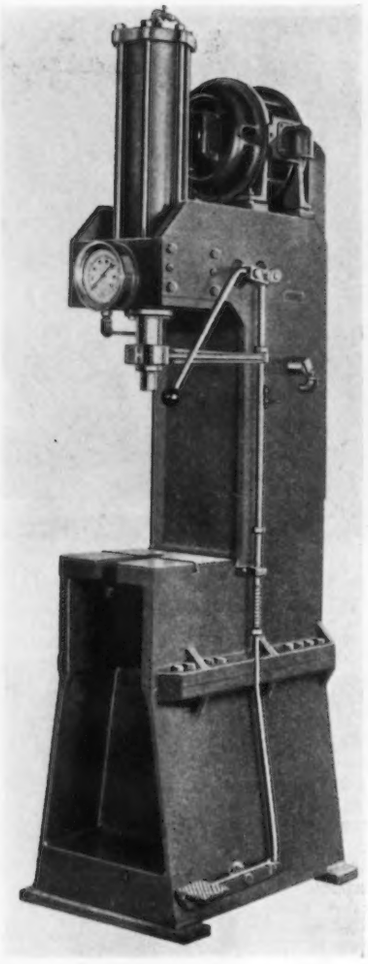


ABOVE

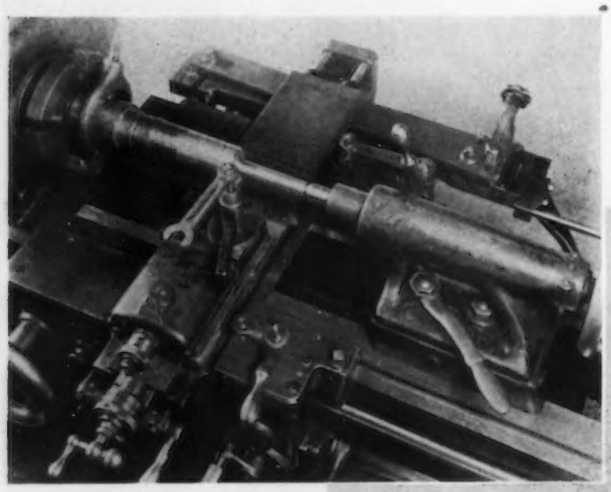
THREE ounces is the weight specification for this complete ¼-in. die head, referred to on page 35. Standard application is for any machine arranged for backing-off threads.



LARGE dust particles are removed by a water-air wash and small particles are trapped by a broth-flotation filter carpet in the operation of this industrial air-filter as covered on page 35.



THIS new hydraulic forcing and broaching press, described on page 35, is made in ½ to 50 ton capacities.

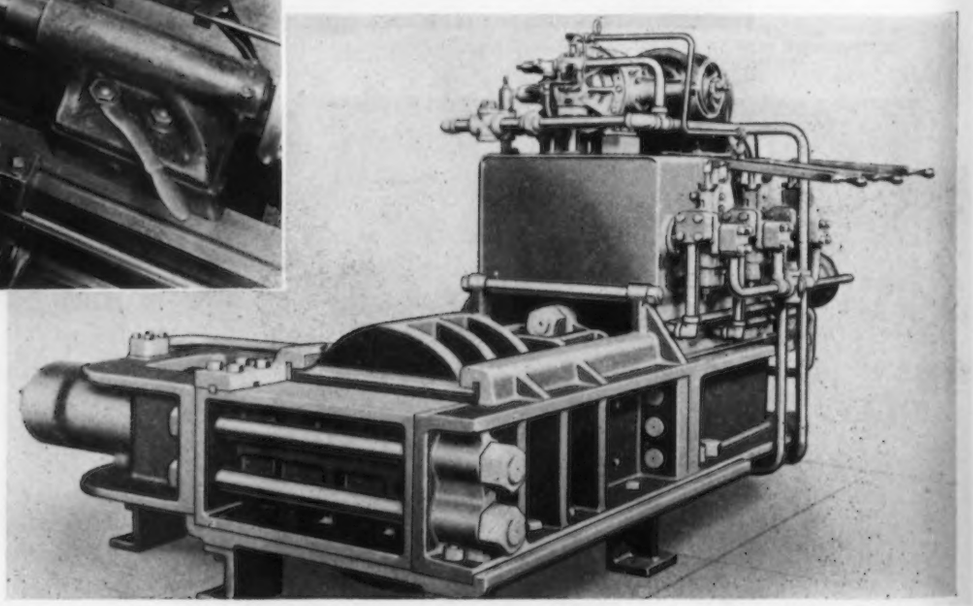


ABOVE

THIS lathe taper attachment permits interrupting straight turning with temporary taper turning in a manner outlined on page 35.

BELOW

THE design details of this heavily reinforced scrap metal baler are given on page 35.



Air Filter Employs "Froth" As a Cleansing Agent

AN industrial air filter having no moving parts and utilizing both a water air-wash, for removing the larger dust particles from the air, and a froth-flotation filter-carpet, so called, for trapping the small dust particles, is pictured on page 34. This equipment as manufactured by the C. O. Bartlett & Snow Co., Cleveland, was demonstrated at the recent exposition held by the American Foundrymen's Association in Philadelphia and is designated as the Traughber "Froth-Flotation" Filter.

It is said that oil can be used as the frothing agent and that two or three quarts is sufficient for an 8-hr. day when used in a 10,000 cu. ft. per min. machine.

Dust laden air is drawn through ducts into a distributing chamber from which it is shot upward through vents and deflected downward, by hooded bells, passing through water and the froth-filter carpet. It is stated that impartial tests demonstrate that air containing 4.5 grains of dust per cu. ft., is clarified to less than 0.015 grains per cu. ft., by a single passage through this filtration.

Angular gravity drainage to sediment drain and to sewer or settling tank, eliminates any necessity for bags or renewable accessories as a part of operating equipment.

Standard installations cover 1000 to 25,000 cu. ft. per min. Two or more units may be installed in parallel for larger capacity requirements or when it is desired that discharged air shall contain less than 0.015 grains of dust per cu. ft.

Hydraulic Scrap-Baler with Controlled Two-Way Pressure

A NEW box-type scrap metal baling machine, hydraulically operated, is illustrated on page 34. The equipment is built by the Hydraulic Press Mfg. Co., Mount Gilead, Ohio, and is a motor-driven, self-contained unit consisting of a heavily ribbed cast steel box for loose scrap metal, inclosed by a heavy sliding door, actuated by a hydraulic cylinder. Two rotary, high-speed, oil-pressure type pumps are employed; the first delivers a large volume of oil at medium pressure; the second, of variable delivery, radial type, builds pressure up to a maximum. The pumps are an H.P.M. product with pressure and volume under automatic regulation through an H.P.M. control device. Pressure is applied to the scrap from two directions: first from the end and then from the side, by means of hydraulic-ram power, which moves platens into the box and applies high-density baling pressure, which is controlled by three valves.

Assembled Die Head Weighs Three Ounces

FOR cutting small diameter, short length threads, the Geometric Tool Co., New Haven, Conn., has developed the new ¼-in., style EJ, die head shown on page 33. Complete with chasers, this outfit weighs but 3 oz. and cuts threads from No. 0 up to No. 14 machine screw sizes, in pitches 20 or finer. Standard application is on any machine arranged for backing off the thread. A recent automatic application shows a die spindle at 7000 r.p.m. Three removable, adjustable chasers are employed; the adjustment permits the cutting of any required decimal size. Location of the chasers in relation to the center of the work, is by a cam fitting into lug-slots on the bottom of the chaser. Held in position by a face plate, the chasers protrude through the plate sufficiently to provide for close-to-shoulder threading. Chaser removal calls for the loosening of one screw and a pull-pressure on the knurled cam.

Lathe Taper Attachment Serves Dual Purpose

STEEP angle tapers are said to be accurately started and stopped at predetermined points in straight cutting operations through the lathe use of a new attachment by the Reed-Prentice Corpn., Worcester, Mass. A set-up of the attachment is shown on page 34. Any included angle up to 120 deg is possible.

In operation, a shaft may be straight turned to a point where it is desired to start a taper cut, at which point the engaging lever on the right hand wing of the carriage is moved to engage a clutch. Following clutch engagement, the entire taper attachment slide is set in motion. This motion may be stopped at will by clutch disengagement. Determination of the angle of taper is dependent upon both the rate of movement of the slide relative to carriage travel, and the angularity of the taper bar. Safety stops are provided so that the clutch is disengaged at the limits of travel of the slide, thus preventing possibility of damage to the machine. The attachment is also made as a forming attachment, with the master form of greater length than the form produced on the work, thus permitting use of a roller follower for producing relatively sharp corners on the work.

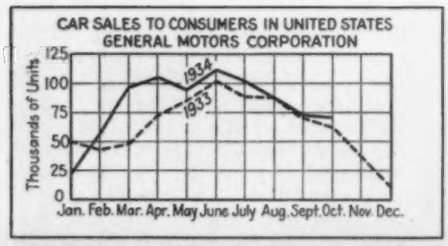
Crankarm Contour Lathe Weighs 62,000 Lb.

ON page 33, is shown a new "Contour Turning Lathe" built by Wicks Brothers, Saginaw, Mich., for simultaneously turning the contours on the 12 crankarms of a heavy six throw, seven-line bearing crankshaft, first roughing, and then finishing with a fine cut. As shown in the close-up view, the work is supported on three center bearings by means of a roller rest. The extreme hardness of the material, a Brinell hardness up to 385, requires rugged construction which accounts for the 62,000 lb. machine weight. The base is built up of 1½-in. and 2-in. cross rolled steel plates welded. The machine drive is by 30 hp. constant speed motor, through a speed reducer. The hydraulic and cooling compound pumps are driven by separate motors.

New Forcing and Broaching Presses

NEW hydraulic forcing and broaching presses with capacities from ½ ton to 50 tons, are announced by the Logansport Machine Co., Logansport, Ind. One model is pictured on page 34.

The construction is all steel, electrically welded. The oil reservoir for the hydraulic circuit is in the column of the press. The oil pump, valves, etc., are mounted on a panel attached to the column and are within the oil reservoir. The pump is chain driven by a motor mounted at the top of the column. Hydraulic control is by selective foot or hand operation for the down travel of the ram; either automatic or manual reverse of ram is provided; reverse can be at any point of the down stroke. At top position of the ram, the pump bypasses and does not work against pressure. Bench mountings for small presses up to 5-ton capacity and hydraulic or air-operated work-holding fixtures can be furnished.



THIS WEEK ON THE

Automotive Industry Still Awaits News On Ford's Plans—Economy Stressed

DETROIT, Nov. 13.

A CORRECT appraisal of the automotive scene is made difficult by the many seemingly conflicting factors which are present, yet out of the whirl of passing events one fact emerges undisputed—Mr. Ford dominates the stage. Whether the public is to have in 1935 a continuation of the ballyhoo of bigger and better cars or is to be sold economical transportation depends on what price tag the Dearborn wizard puts on his new V-eights.

Developments in the last week point to the belief on the part of both Chevrolet and Plymouth that price will be a headline feature during the coming year. A few months ago Mr. Ford went on record to the effect that prices must come down if the market for automobiles and other products is to be extended. Mr. Sloan, General Motors chief, is of the same opinion. It will be recalled that Mr. Ford objected last April to higher car prices and by refusing to raise his own prices spoiled his competitors' plans.

What is he going to do this time? General Motors and Chrysler would just about give their right arms to know. Indications are that they expect him to push them hard on price. It has already been reported that Plymouth threw knee action overboard in an effort to lighten costs. With plans so uncertain, it may be reinstated, but at present a return to conventional front-end design is said to have been ordered.

Chevrolet to Put More Stress on Standard Models

If Chevrolet finds itself in a tight place, it also has an out. It can't gracefully eliminate knee action from its Master cars, since its 1934 advertising campaign has been largely built around this feature. On the other hand, its Standard cars have been sold all year without benefit of knee action, and orders for parts and materials point to considerably larger production of this series in 1935 compared with the number of Master jobs tentatively scheduled. It is believed on good authority that Standard assemblies next year will average around 25,000 units a month. It is highly probable that early in the year they may be much greater than that.

There is another reason, for which General Motors is responsible, why Chevrolet may swing emphasis to its Standard series. Pontiac will have a six as well as an eight in 1935 and its price will not be far above that of Chevrolet's Master models. No one yet knows to what extent Pontiac may cut into Chevrolet's sales, or, for that matter, to sales of the Oldsmobile six, another G.M. car.

One thing seems assured—whatever cars Chevrolet assembles in December will be Standard jobs, commercial cars and trucks rather than Master cars. Key dies for the Master, it is understood, will not be delivered to the Fisher Body plant in Cleveland until late in December, thus forestalling assemblies on a mass scale until well into January. In fact, it will not surprise Detroit if several important car makers find themselves limited in the next 90 days by the number of bodies they can secure. This tight situation will be caused by the drastic changes in body design and by the usual delays in working the "bugs" out of new production processes.

Ford Slowly Expanding Operations

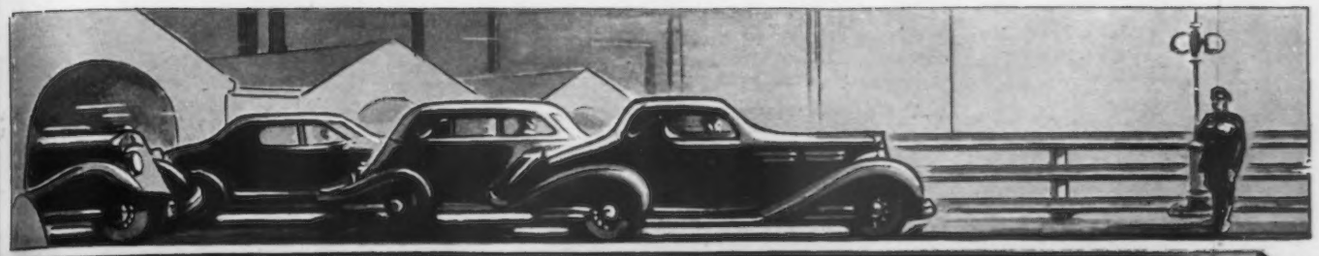
Ford is straining to get into full operation at Rouge as soon as possible. It is said that about 1500 motors a day are now being manufactured at Dearborn and are being stored against future assembly requirements. More releases are being given to Ford suppliers each day and plants furnishing Ford with materials should be running at a good rate before the end of November. Steel orders from Dearborn are increasing and a buy of considerable proportions may be made later this month. No hint has been given regarding an announcement date for the V-eight, but the consensus of opinion is that it will be about the middle of December.

At the moment it is a toss-up whether Ford, Hudson-Terraplane, Pontiac or Dodge will be the first in the field with 1935 models. Hudson is having a pre-showing for its suppliers on Nov. 15; the assumption is that it will show its cars publicly in December. Dodge will undrape its models for the benefit of its dealers on Nov. 17, but this event no doubt is well in advance of its public announcement.

G.M. Aims at Stabilized Employment

Mr. Sloan's pronouncement that General Motors is to "stagger" the introduction of new models in 1935, presenting some cars as late as the early fall, was received with some skepticism in automotive circles, so far as its effect on stabilizing employment is concerned. Mr. Sloan pointed out that 7.5 per cent of total sales of cars are made in November and December, compared with 24 per cent in April and May, and that 60 per cent of the industry's yearly output is sold in the first six months. While the corporation's proposed efforts are praiseworthy, past experience hardly leads one to the belief that they will go far toward leveling off the sales and production peaks.

It is only in the last two or three years that the industry has stood together in concentrating announce-



ASSEMBLY LINE

By BURNHAM FINNEY
Detroit Editor, THE IRON AGE

ments of new cars at the year-end. Adherence to this agreement has not been notable. Take the past year, for example. Chevrolet introduced its Master series in December and its Standard line in April. Buick's series 50, 60 and 90 made their bow in November, but the 40 series was not ready until April. Olds didn't get going at a rapid clip until March. Plymouth introduced various lines at intervals of a month or two until it had four series of cars. Auburn presented one car at the January shows and another in September. Packard's new line appeared in September. Chevrolet won the prize for a late announcement of a 1934 model by holding back a five-passenger, four-door sedan in its Standard line until early October. Yet 1934 had its seasonal sales peak the same as the preceding years.

It used to be that Buick, Studebaker and Nash, as well as a few other companies, brought out new cars in late July or August. This policy undoubtedly stimulated activity, and in turn employment, in the factories of those companies at a time of the year when the industry's operations usually are slipping because of seasonal factors. On the other hand, examination of sales records shows that the industry as a whole still had its seasonal peaks.

A Step in Right Direction

Aside from the question of whether the proposed plan will help much in overcoming the seasonal elements heretofore present in the automobile industry, observers agree that General Motors is taking a step in the right direction and that it apparently is doing everything within reason to attain that stability of employment which management, labor and President Roosevelt would like to see in the automobile industry.

As previously mentioned in this column, Detroit has long known that General Motors didn't intend to concentrate all its new model announcements in December and January. Buick, La Salle and Cadillac have been planning on new cars next spring rather than at the New York show. For two years Chevrolet has exhibited only one series of new cars at the year-end, saving the other for spring. There is no reason to believe that it will depart from this policy in 1935.

On this matter of lengthening new model introductions, the entire industry of necessity must take a realistic attitude. Car manufacturers are operating private companies in which hundreds of stockholders have heavy stakes. The managements are responsible for success or failure of their products and, in turn, for the payment or non-payment of dividends. They can go, therefore, only so far as the competitive situation will let them go in the determination of production and sales programs. Everyone would like to see car sales divided evenly among the 12 months of the year. Workers then would have a steady income and manufacturing costs would be substantially lowered. Unfortunately no one has ever been able to figure out how this can be done.

Exports Help Considerably

One practical suggestion for helping to keep output at a higher level during the off months came out of the meeting of export managers of car companies in Detroit the past week. It was stated that a large potential market for American-built automobiles exists in the southern hemisphere, where the seasons are the opposite of ours. The usual spring and summer demand there would aid American car factories during the early fall and winter. It so happens that almost all of the southern countries are non-manufacturing countries, and American cars are favored over cars from Europe because of their quality and popularity of design. High import duties are the sole barrier. The automobile industry is hoping that President Roosevelt's tariff agreements, now being negotiated, will help to open up these markets. The best foreign market for American cars this year has been the Union of South Africa, where the revival of gold mining has brought prosperity to the people. South America and Australia offer large possibilities. So does the Far East. The fact is little recognized that Europe hasn't nearly the potentialities as an automotive market as other parts of the world and that already American companies are busy developing these larger markets.

Buick Makes Plans

Buick is in the engineering stages of the development of new lines to be ready next spring. It is understood that a new engine for the 40 model is being considered. Another matter being given serious thought is said to be the elimination of the 50 and 90 series, leaving Buick with two series of cars—the 40 and 60. This would simplify production problems and lower costs. It is reported that about half of Buick's production and sales this year have consisted of the 40, even though it was not on the market until May. Buick is completing its separation from Pontiac by setting up its own field sales organization, the country having been divided into 14 zones with factory representatives in charge of each zone.

Buick now is spending about $275,000 for large hammers, furnaces and auxiliary equipment for modernization of the crankshaft division of its forge shop at Flint.

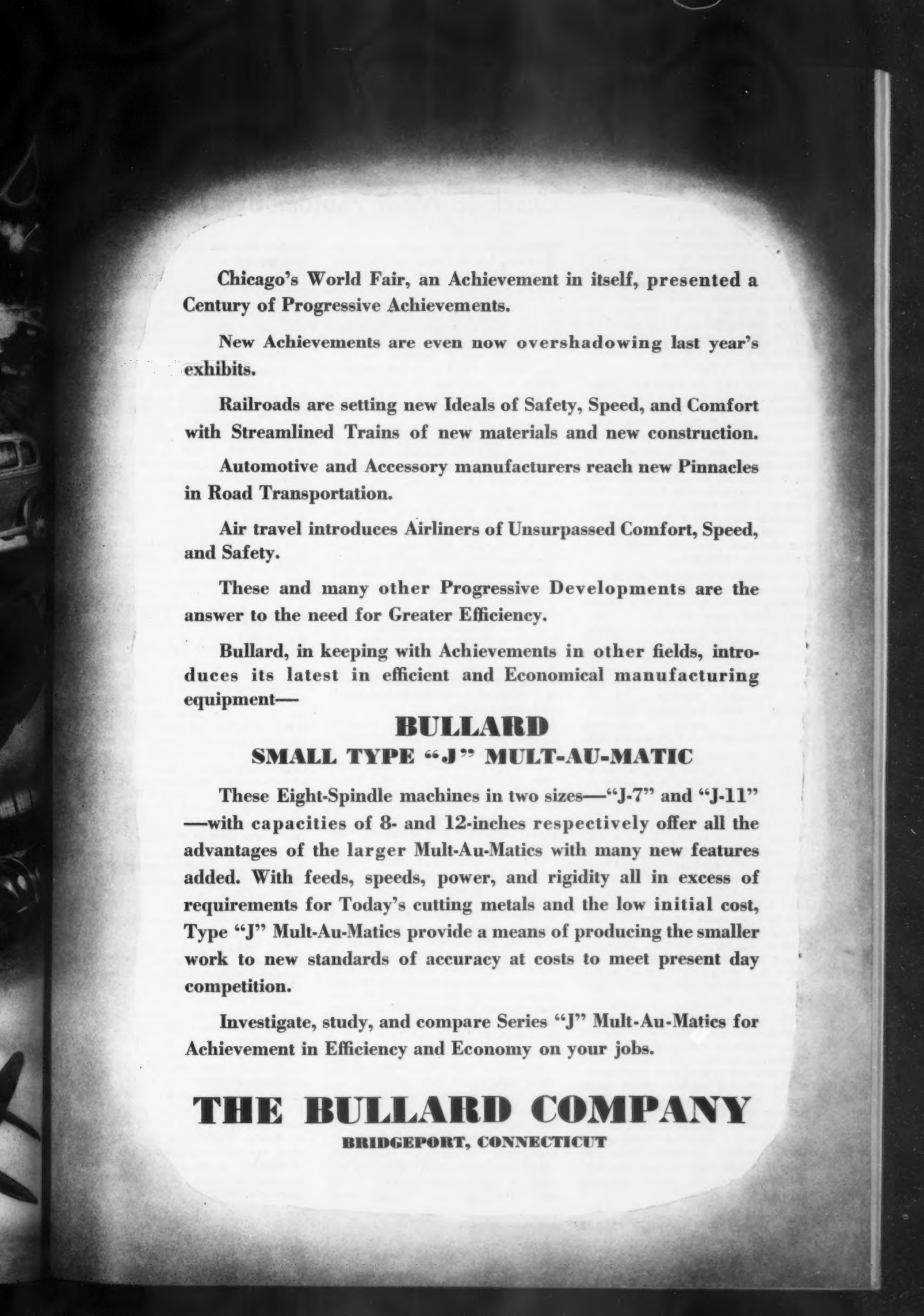
Steel Purchases Begun

Support for the steel market has come the past week from Chevrolet and Chrysler, the former having placed orders for its local gear and axle plant and for Flint. Much of the tonnage is for immediate rolling and delivery this month in preparation for parts manufacture on a sizable scale in December.

Early this year Chrysler and General Motors engaged in a lively advertising battle over the merits of all-steel bodies as against wood-and-steel body construction. When the fight reached the point that very nasty things were being said by both

(Continued on Page 40)

Achievements



Chicago's World Fair, an Achievement in itself, presented a Century of Progressive Achievements.

New Achievements are even now overshadowing last year's exhibits.

Railroads are setting new Ideals of Safety, Speed, and Comfort with Streamlined Trains of new materials and new construction.

Automotive and Accessory manufacturers reach new Pinnacles in Road Transportation.

Air travel introduces Airliners of Unsurpassed Comfort, Speed, and Safety.

These and many other Progressive Developments are the answer to the need for Greater Efficiency.

Bullard, in keeping with Achievements in other fields, introduces its latest in efficient and Economical manufacturing equipment—

BULLARD

SMALL TYPE "J" MULT-AU-MATIC

These Eight-Spindle machines in two sizes—"J-7" and "J-11" —with capacities of 8- and 12-inches respectively offer all the advantages of the larger Mult-Au-Matics with many new features added. With feeds, speeds, power, and rigidity all in excess of requirements for Today's cutting metals and the low initial cost, Type "J" Mult-Au-Matics provide a means of producing the smaller work to new standards of accuracy at costs to meet present day competition.

Investigate, study, and compare Series "J" Mult-Au-Matics for Achievement in Efficiency and Economy on your jobs.

THE BULLARD COMPANY

BRIDGEPORT, CONNECTICUT

This Week on the Assembly Line

(Continued from Page 37)

sides, a halt was called by mutual consent. A similar public controversy is likely to develop over the all-steel roof. Companies which will feature it are preparing to publicize its safety. Manufacturers not yet converted to it are getting ready to tell the car owner that all-steel construction has its drawbacks. They probably won't hesitate to become specific in naming the objections.

Although both Plymouth and Dodge are reported to have discarded independent springing largely for the sake of economy, they are not satisfied to use silicon manganese steel for leaf springs again. It will be recalled that Harold Wills developed for Chrysler Corpn. a special molybdenum steel from which coil springs have been made this year. It is understood that this alloy steel will be employed in 1935 for leaf springs for all Chrysler-made cars, the result being a smoother, better ride.

Metallurgists of several steel companies are reported to have been working with Chrysler on this matter and initial orders are said to have been placed for molybdenum spring steel delivery to spring manufacturers which will build springs for various Chrysler divisions. Apparently the Chrysler department which has been devoted to fabrication of coil springs is to be abandoned although about $350,000 worth of equipment was purchased for it only a year ago.

Both Chevrolet and Plymouth are believed to be making preparations to stress their standard cars early in 1935. The proportion of Chevrolet standard jobs to master cars is understood to have risen in recent months and has accounted for a surprisingly large percentage of sales recently. The standard line has been especially popular in the South where economical transportation seems to have a strong appeal. Plymouth is said to have made considerably more money the past year on its standard than on its deluxe series. Thus the bigger and better car idea in the so-called low price field may surrender the spotlight to the idea of cheap transportation.

The three-cornered fight brewing among Ford, Chevrolet and Plymouth may eventually lead to the first real attempt in years to recover for manufacturers of new cars at least a part of the Model T market. With many plants closed during the retooling process and others going along on slim schedules, assemblies this month will do well if they top 70,000 units. It is too early to judge what the December total will be but considerable expansion in output appears assured.

Machine Tool Industry Has Been Quick to Meet Automotive Needs

THE machine tool industry, on the whole, has not been slow to meet present-day needs of the automobile industry, which call for high output, low cost per piece and the ability to shift machines from one set-up to another one at relatively small expense, stated Ralph E. Flanders, president Jones & Lamson Machine Co., Springfield, Vt., in an address before the American Society of Tool Engineers in Detroit on Nov. 8.

Mr. Flanders cited the recent development of machines with standard feed and driving units but with special tooling. The standard units of these machines are not obsoleted for automobile manufacturers when models change; only the special tooling must be replaced. For this reason the usual procedure of calculating in what time a machine must pay for itself in an automotive plant must be discarded in favor of a formula which allots one length of time for the standard units and another for the special equipment. It is fair to charge off the latter perhaps in one year, but the standard units should be given probably five or six years, inasmuch as they will last considerably longer than that. The old idea that a machine tool must pay for itself within the life of a particular car model no longer applies.

Replacement of a machine often is justified long before it pays for itself, remarked Mr. Flanders. The prospective equipment buyer should compare all the cost factors of the old machine against all the cost factors of the new machine, and the time will arrive when he will be less out of pocket with the new machine than with the old.

Four Stages of Development

There have been four stages of development in the automobile industry, each of which has had a profound effect on the machine tool industry. The first stage was that of development of the industry in its early days, when standard machine tools similar to those built for other industries were bought in large numbers. This was the machine tool industry's happiest period.

The second stage marked the appearance of large scale production, when specialized machine tools got their start. In this stage such specialized equipment as cam grinders and multiple drill heads was introduced. The third stage was that of continuous production (sometimes called mass production) when the design of automobiles became fairly well stabilized and changes were neither frequent nor radical. During this period special high-production, single-purpose machine tools were in demand by car manufacturers. There followed a time when more frequent changes were made in car design and the special type of equipment installed in many plants proved unadaptable and expensive.

At present the automobile industry is in a fourth stage when production is continuous, but there is a continual shifting in car designs. This is the period during which machine tool builders have been able to design standard units with special tooling. The stability of design of these units, stated Mr. Flanders, makes for excellence in the product and has resulted in better bearings, smoother drives, centralized lubrication and other constructive developments. It is a situation from which both the builders and users of equipment are benefiting.

Cost of Living Off Slightly Last Month

THE first decline since April of this year in the cost of living of wage-earners in the United States occurred in October, according to the indexes computed by the National Industrial Conference Board. Increases in the cost of some major groups of expenditure were offset by declines in others; the net result was a slight decrease of 0.1 per cent. Living costs in October were 3.7 per cent higher than in October, 1933, but 19.9 per cent lower than in October, 1929.

The purchasing value of the dollar was 123.6c. in October, compared with 122.5c. in September, 139.9c. in April, 1933, and 100c. in 1923.

The National Supply Co. of Delaware and subsidiaries, including Spang, Chalfant & Co., Inc., in the nine months ended Sept. 30, had consolidated net profit of $127,074 after taxes, depreciation, interest and guaranteed dividends on National Supply Co. preferred stock, but before dividends on Spang, Chalfant preferred stock which were not declared. This compares with net loss of $2,309,258 in the first nine months of last year. For the September quarter, net loss amounted to $121,113 before dividends on Spang, Chalfant & Co. preferred stock not declared, against net profit of $603,958 in the June quarter, and net loss of $353,116 in the third quarter of 1933.

THE NEWS OF THE WEEK

Canada Buys 1,250,000 Boxes of British Tin Plate For 1935 Delivery

LONDON, ENGLAND, Oct. 12 (*By Cable*).—Pig iron is active. The export price has advanced about 1s. 6d. and demand is improving on sales to Germany and Italy.

Order books on semi-finished steel are healthy and few orders are being placed abroad. Home demand for finished steel is increasing and exports are sustained.

Richard Thomas has sold Canada 1,250,000 basis boxes of tin plate for next year's shipment and arranged to supply the same consumer's requirements for several years. Other exports of tin plate are improving except in the Far East.

Continental iron and steel demand is satisfactory with good export orders for semi-finished steel, joists and wire rods reported. The rise in sterling is facilitating transactions. The sterling export coefficient has been reduced from 1.675 to 1.65.

The International Raw Steel Cartel has refrained from raising prices, probably in view of United States competition in Far East and may shortly reduce prices to certain destinations, particularly Russia, owing to Polish competition, and British India, owing to new customs tariff.

Far Eastern freight rates will be raised Feb. 1, 6d to Japan and 3s. to China and the Straits Settlements.

The international ship plate convention has been postponed until Dec. 31.

British Prices, f.o.b. United Kingdom Ports

Per Gross Ton

Ferromanganese, export	£9
Billets, open-hrth.	£5 10s. to £5 15s.
Tin plate, per base box	18s. 2d.
Steel bars, open-hearth	£7 17½s.
Beams, open-hrth.	£7 7½s.
Channels, open-hearth	£7 12½s.
Angles, open-hearth	£7 7½s.
Black sheets, No. 24 gage	£9 5s.
Galvanized sheets, No. 24 gage	£11 5s.

Official Continental Prices, f.o.b. Continental Ports

Per Metric Ton, Gold £

Current dollar equivalent is ascertained by multiplying gold pound price by 124.14 to obtain franc equivalent and then converting at present rate of dollar-franc exchange

Billets, Thomas	£2 7s.
Wire rods, No. 5 B.W.G.	£4 10s.
Steel bars, merchant	£3 5s.
Sheet bars	£2 8s.
Plates, ¼ in. and up	£4
Plates, 3/16 in. and 5 mm	£4 2s. 6d.
Sheets, ⅛ in.	£4 7s. 6d.
Beams, Thomas	£3 2s. 6d.
Angles (Basic)	£3 2s. 6d.
Hoops and strip base	£4 2s. 6d.
Wire, plain, No. 8	£5 7s. 6d.
Wire nails	£5 15s.
Wire, barbed, 4-pt. No. 10 B.W.G.	£8 15s.

New Die Casting Company Formed

THE American Type Founders Co., in keeping with its policy of confining its activities to the printing industry and kindred trades, has discontinued its die casting division. Edgar N. Dollin, former president of the Allied and Acme die casting corporations, has formed a new corporation to be known as the Dollin Corpn., to take over the American Type die casting division, and at the same time the die casting division of the Lionel Corpn. Associated with Mr. Dollin will be J. L. Cowen and Mario Caruso.

The Dollin Corpn. has taken over all the dies, equipment and tools of the two organizations. The die casting sales force of the American Type Founders has been taken over by the new corporation. All orders calling for the use of dies formerly operated by the American Type Founders or Lionel will be filled by the new corporation which will continue to serve the old customers.

The facilities of the new corporation will be substantially enlarged and a program of expansion and development has been mapped out. A new process of die casting and new alloys will also be offered to the public in a short time.

Mr. William Gebauer, former chief engineer and production manager of the Allied Die Casting Corpn., will hold a similar position with the Dollin Corpn. The new corporation will remain at 300 Communipaw Avenue, Jersey City, N. J., until late November or early December when it will move to Sager Place, Irvington, N. J.

Geuder, Paeschke & Frey Again Operating

OPERATIONS were resumed at the plant of Geuder, Paeschke & Frey Co., Milwaukee, on Nov. 5, following a strike which had lasted since Aug. 13. Under the terms of settlement the company recognized the union only as a representative of its own members. The company specifically reserved the right to bargain with any individual employee or any groups of employees not affiliated with the union.

Trackwork Shipments Lower in October

SHIPMENTS of trackwork for tee rail track of 60 lb. per yd. and heavier were 2153 tons during October, according to the American Iron and Steel Institute. September shipments were 3383 tons, while the October, 1933, movement was 3006 tons.

The Chicago Purchasing Agents' Association has moved its headquarters from the Great Northern Hotel to Suite 319 in the Hotel Sherman where the offices of the association will be considerably enlarged.

Steel Corporation's October Shipments At Lowest Level Since January

SHIPMENTS of steel products by the United States Steel Corpn. during October declined to 343,962 tons, the lowest level since January, when 331,777 tons was moved. September shipments were 370,306 tons, while in October, 1933, the total was 572,897 tons. October shipments were sufficient to engage the corporation's finished steel-making facilities at 20.6 per cent of capacity, compared with 23 per cent in the previous month and with 35.6 per cent in October of last year.

MONTHLY SHIPMENTS OF STEEL PRODUCTS BY UNITED STATES STEEL CORPN.

Month	1930	1931	1932	1933 Shipments	1933 Per Cent of Capacity	1934 Shipments	1934 Per Cent of Capacity
January	1,104,168	800,031	426,271	285,138	17.7	331,777	19.8
February	1,141,912	762,522	413,001	275,929	18.5	385,500	26.3
March	1,240,171	907,251	388,579	256,793	15.3	588,209	36.6
April	1,188,456	878,558	395,091	335,321	21.6	643,009	41.5
May	1,203,916	764,178	338,202	455,302	27.1	745,063	44.4
June	984,739	653,104	324,746	603,937	37.4	985,337	61.2
July	946,745	593,900	272,448	701,322	45.1	369,938	23.0
August	947,402	573,372	291,688	668,155	39.8	378,023	23.1
September	867,282	486,928	316,019	575,161	35.6	370,306	23.0
October	784,648	476,032	310,007	572,897	35.5	343,962	20.6
November	676,016	435,697	275,594	430,358	26.7	.....	...
December	579,098	351,211	227,576	600,639	38.7	.....	...
Plus yearly adjustment	(40,259)	(6,040)	(5,160)	(44,283)	...	.....	...
Total for year..	11,624,294	7,676,744	3,974,062	5,805,235	30.1	.....	...

A.S.T.M. Committee On Refractories Meets

The recent meeting of A.S.T.M. committee C-8 on refractories in Pittsburgh was the 50th held by the committee since its organization in 1914. There was extended discussion of the various standardization and research matters on the committee's program of work and as a result of action taken at the meeting a number of recommendations are being submitted to letter ballot of the whole committee. Some of these are discussed in the following paragraphs.

Three new specifications are being balloted upon. These include a method of testing refractories to determine permanent linear change after reheating to 1400 deg. C. and holding at that temperature for five hours. This test is widely used in specifications and is considered valuable, although results should be interpreted by one well versed in the behavior of refractory materials. The other two specifications cover malleable furnace brick and boiler furnace brick, these being respectively extensive revisions of existing specifications C-63 and C-64. Upon issuance as tentative of the proposed revised specification, the committee recommends the withdrawal of the existing standards.

A number of research activities were reported upon. A study of methods of determining heat conductivity is under way in order that better agreement can be obtained between different laboratories and recommendations are being drafted for a standard procedure for the petrographic examination of certain types of refractory brick. There was extended discussion of the question of adopting a series of standard pyrometric cones with uniform temperature intervals which would replace those of non-uniform intervals used at present for test purposes. A further study of this matter will be undertaken.

Steel Frames for Concrete Houses?

Announcement has been made in Washington of the construction of a new type of concrete house, built of slabs of reinforced architectural concrete. The initial house, however, was built on a wood frame. The failure to use steel for this purpose was charged by John J. Earley, the inventor and builder of the house, to the fact that the steel industry had provided no adequately light framework for this purpose.

"Our panels are made of 2-in. reinforced concrete with a crushing strength of 6000 lbs. to the sq. in.," said Mr. Earley. "These panels are sufficiently strong to support a roof without additional framework. The only need for a frame is to make a place for insulation and to carry plaster and interior decoration. So far as the walls are concerned, we could take out entirely the interior framework after the concrete panels have been assembled and anchored to the light concrete pillars which are cast at each joint.

"Steel has played an important part in all concrete building. It is the natural ally of concrete. We used steel reinforcements in the concrete slabs. But when we came to build, we found no steel frames in the market light enough to make an economic framework for such a house. Now that the house has demonstrated the success of architectural concrete panels for this purpose, we hope the engineers of the steel industry will design a framework which will add to the economy of such a house."

General Electric Plan for Unemployment Pensions

AFTER more than four years of experience with the unemployment pension plan adopted in June, 1930, Gerard Swope, president, General Electric Co., has announced that the emergency has ceased and that the amended normal plan has been put into effect. During these four years almost $5,500,000 has been collected from the employees and the company, and over $3,700,000 has been disbursed for employee benefits, leaving in the treasury today almost $1,800,000.

As a result of these four years of trying experience, the administrators of the plan at each of the different works—each board made up equally of workers elected by their fellows and members appointed to represent the company—have studied the plan carefully and have made suggestions for amendments to the plan. These have been considered by the workers, adopted by the administrators representing the workers, and during an interval of 30 days have been further considered and at the expiration of this period have again been approved. The administrators at every works have now unanimously ratified the amendments and the amended plan went into effect Nov. 1.

The company continues to give the plan its financial support, paying into the fund an amount equal to that paid by all employees.

"Beyond The New Deal," by David Lawrence, recently published by the McGraw-Hill Book Co., Inc., New York, represents the viewpoint of an intelligent conservative who analyzes the New Deal and its implications to Government and individuals. In his survey, Mr. Lawrence gives credit to the New Order where credit is due, but he is much concerned about the future and points out some of the jokers in the New Deal. Some of the divisions of the book are self-descriptive. They include "Uncle Sam Becomes a Partner," "The Profit System Under the New Deal," "Discipline for Business," "Wealth Takes a Holiday," "Always Back to Gold," "Responsible Government and Individualism," and "The Call for a New Nationalism."

... PERSONALS ...

G. G. COOLIDGE, since 1929 assistant to the president of the Harbison-Walker Refractories Co., Pittsburgh, has been elected vice-president and a director of the company. Soon after graduation from Yale University in 1904, Mr. Coolidge became connected with the Delaware, Lackawanna & Western Railroad Co. and later with the Westinghouse Air Brake Co. In 1906 he became a member of the Pittsburgh district sales office of the Harbison-Walker company, was made district sales manager of the Pittsburgh distract in 1911 and assistant general sales manager in 1924.

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A. P. MARWICK, formerly identified with the Chicago office of the Taylor-Wharton Iron & Steel Co., High Bridge, N. J., has been appointed sales manager of the Burnside Steel Foundry Co., Chicago. He started with the Pettibone-Mulliken Co., Chicago, as a clerk in the railway track supply business in 1906 and through steady promotions became manager of manganese sales in 1927. He resigned in 1929 to become associated with the Taylor-Wharton company.

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EDWARD NAGEL, for 20 years associated with the Detroit plant of the Chicago Pneumatic Tool Co., Chicago, has taken complete charge of the manufacturing of parts and the rebuilding of pneumatic tools for the Master Tool Co., Inc., Cleveland.

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GEORGE BATTY, technical director of the Steel Castings Development Bureau since its inception in 1928, has resigned to become identified with the Crucible Steel Casting Co., Lansdowne, Pa., as technical director in charge of production and metallurgical development.

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ARTHUR E. MURTON, heretofore superintendent of the roll foundry of the Hubbard division of the Continental Roll & Steel Foundry Co., East Chicago, Ind., has been appointed to take charge of the manufacture of rolls at the Lima and Springfield, Ohio, plants of the Ohio Steel Foundry Co., Lima, Ohio.

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ROBERT J. WORKING, since 1930 assistant district sales manager of the Cincinnati office of the Republic Steel Corpn., Youngstown, has been made district sales manager in Cincinnati, succeeding W. A. PECK. Formerly in the sales department of United Alloy Steel Corpn., Mr. Working was placed in charge of the Cincinnati district office of the Central Alloy Steel Corpn. in 1927.

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WALTER A. BOWE, who resigned recently as advertising manager of the air-conditioning department of the General Electric Co., has joined the sales staff of the American Sheet & Tin Plate Co., Pittsburgh.

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M. L. BETTCHER, formerly general superintendent of the Duriron Co., Inc., Dayton, Ohio, has been made general manager, succeeding DUDLEY H. MILLER, who becomes executive vice-president. Mr. Bettcher joined the Duriron organization in January, 1920, as a salesman in the Chicago district and later was transferred to the manufacturing department in Dayton. N. E. PHILPOT, who has been manager of the Chicago office for several years, is assuming charge of the New York office, succeeding W. E. PRATT, who has resigned. COL. M. W. SMITH, formerly manager at Buffalo, is taking over the Chicago office, and W. A. WATKINS has been transferred from the general sales department at Dayton to Buffalo as manager.

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DR. VSEVOLOD N. KRIVOBOK, a member of the research staff of the Bureau of Metallurgical Research, Carnegie Institute of Technology, has joined the research staff of the Allegheny Steel Co., Brackenridge, Pa. Dr. Krivobok has been on the staff of the Carnegie Institute for the past 10 years, and as a member of its research staff he has investigated many metallurgical problems pertaining principally to special steels. He has published numerous papers and journals on chrome-nickel steels, and has served as consultant in testing special steels and as a technical adviser in the manufacture of stainless steel.

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F. R. KOHNSTAMM has been appointed manager of the lighting division of the Westinghouse Electric & Mfg. Co. In his new position he will supervise all lighting activities for the company, including sales, engineering and manufacturing now conducted at the Westinghouse Cleveland works. Prior to his appointment he was sales promotion manager of the company, with headquarters at East Pittsburgh.

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WILLIAM J. FAIRBAIRN, secretary of the Milwaukee branch of the National Metal Trades Association virtually since its organization, has resigned after 32 years of service. He is succeeded by ANSEL R. PEIRCE, of Chicago, director of the association's industrial education department. Although his resignation was effective Nov. 1, Mr. Fairbairn will remain with the office for the time being. His plans for the future are indefinite. Before he organized the branch, Mr. Fairbairn was for three years manager of the Western Malleable & Grey Iron Mfg. Co., Milwaukee. Previously he was roundhouse superintendent for the Milwaukee Road at Austin, Minn.

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DR. STEWART SCRIMSHAW, professor of economics and industrial relations at Marquette University, Milwaukee, has been granted a leave of absence to accept appointment by the National Labor Relations Board as director of its newly established Milwaukee district branch. He was for nine years personnel director of the Kearney & Trecker Corpn., Milwaukee, and previously was for five years supervisor of apprenticeship for the Industrial Commission of Wisconsin. He is a graduate of the University of Wisconsin and Ohio State University.

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WILLIAM H. DAVIS, formerly National Compliance Director, has been appointed to make a study of problems relating to compliance and enforcement by the N.I.R.B. In August, 1933, Mr. Davis was appointed deputy administrator in the National Recovery Administration and in November of that year he was made National Compliance Director, in charge of the newly formed compliance division, serving in this capacity until June, 1934.

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CHARLES B. LANSING has been elected general manager of the Ferry Cap & Set Screw Co., Cleveland. He has been president of the National Tile Co., Anderson, Ind.

Decision by the Columbia Steel Co., San Francisco, to undertake the manufacture of "Seal of Quality" galvanized sheets, means that the campaign for the greater use of heavy-coated galvanized roofing will be actively extended in the West Coast territory. Heretofore the efforts of the American Zinc Institute in the western field have been more or less limited, due to the need for concentration at other points; but such work as has been done, especially with agricultural colleges, extension agencies and other factors in the farm, mining and industrial fields, has aroused considerable consumer interest and market possibilities have become very attractive. The action of Columbia Steel Co. in becoming a "Seal of Quality" licensee indicates its intention to take aggressive advantage of these possibilities.

The Colorado Fuel & Iron Co. and subsidiary companies had an operating loss of $446,836 in the quarter ended Sept. 30, compared with a loss of $750,812 in the third quarter of last year. During the first nine months of 1934, net profit, after taxes and charges, was $195,625 compared with a loss of $2,307,273 sustained in the like period of 1933.

THE WEEK IN WASHINGTON

Legislative Program Under Consideration

Radical Congress May Suggest Wild Schemes Which President Is Expected to Hold in Check—Labor Demands Certain

WASHINGTON, Nov. 13.—The most radical Congress in American history will take office Jan. 2.

This is the inevitable conclusion after surveying results of the election of last week. The New Deal victory was so overwhelming that it promises to be embarrassing to the Roosevelt Administration. For coming in on the tidal wave of so-called Democratic votes were many candidates for both the House and the Senate who are pronounced "left wingers." They are prepared to espouse almost every conceivable "ism." Added to them are members of such blocs as the Farmer-Labor and Progressive.

The product of a discontented electorate, legislation that would wreck the traditional machinery of the country undoubtedly will be freely offered. The task of the Administration will be to forestall such legislation and to hold back the radical elements. How successful the effort will be cannot be known until tests have been actually made.

While the President unquestionably will have strong control over the next Congress, there is concern as to whether he can check some of the radical moves that will be made. But beyond this business and industry are apprehensive of legislation that may be enacted through the New Deal Administration forces themselves. As for organized labor it has manifested enthusiasm over prospective legislation at the next session of Congress, judging by statements by William Green, president of the American Federation of Labor.

By L. W. MOFFETT
Resident Washington Editor, THE IRON AGE

Outstanding forces that will reflect strength in incoming Congress are Democrats who will press vigorously for inflation, the soldiers' bonus, the 30-hr. week and radical farm legislation for payment of debts. The Administration probably will have genuine difficulty in handling the situation.

It has been stated that two-thirds of the Democratic Senators favor the payment of a $2,000,000,000 bonus and that they necessarily tie in inflation with the plan. In the new House will be, according to reports, 118 members who are outspoken inflationists, while 178 members, favorable to the bonus, advocate its payment with greenbacks by turning the printing presses loose and running off paper that would be as valuable as the fall leaves, and tear down the entire currency system. The prevailing belief is, of course, that a Presidential veto will kill off such legislation, but the strength of the radical element is so great that it has excited wide apprehension.

Generous to Labor

The new Congress, in the opinion of Mr. Green, will be most generous to organized labor. He has predicted that it will enact a labor disputes bill "even stronger than the Wagner bill which lost out last June." The drive of organized labor for the 30-hr. week legislation, he has declared, is greatly strengthened by the election returns and "the new Congress will be a much better one for labor than the Seventy-third Congress."

Returning to Washington last week from his home in Ohio, Mr. Green said he would have an important statement on the automobile labor situation. He announced approval of a letter from F. J. Dillon, American Federation of Labor organizer, to President Alfred P. Sloan, Jr., of the General Motors Corpn., seeking a new agreement "embracing the philosophy enunciated by President Roosevelt." In renewing the automobile code without change until Feb. 1, the President ordered a study regarding seasonal employment, wages and hours in the automobile industry.

Mr. Green's optimism regarding a labor disputes bill even stronger than the Wagner bill apparently is not shared entirely by Senator Wagner.

"Mr. Green may be right in saying we'll pass a stronger bill than was proposed last year," said the Senator, "but that was a pretty strong bill. I expect the President's views will determine how far the measure should go."

Company Unions Under Fire

While it has been indicated that a new bill will be offered that would abolish company unions, it is certain such a measure would be bitterly opposed by industry and it is doubted that it would receive the endorsement of the Administration which is seeking to maintain an "industrial truce." The measure may also be expected to give the National Labor Relations Board power to penalize violators of

Section 7a (collective bargaining) of the National Industrial Recovery Act. There is no doubt that organized labor will seek to amend that section declaring for the principle of majority representation in collective bargaining. The latter proposal, it has been indicated, might have Administration support in view of enunciation of that principle in the Houde case by the National Labor Relations Board. The Administration is expected to oppose the 30-hr. week, but, on the other hand, a compromise not to the taste of industry might be offered.

Problems Under Advisement

Immediate problems being studied by the Administration in preparation for presentation to the next Congress concern the budget, relief, taxation and social legislation. Already it is realized that expenditures next year will be so great that the idea of balancing the budget virtually has been abandoned. With unemployment rated at some 10,000,000, and relief rolls at 18,000,000 the idea of economies is getting diminishing attention. It is doubted that serious efforts to balance the budget will be undertaken for two or three years unless a quicker upturn to recovery develops than is now in prospect. Inflation, so it is reported, will be fought, but to meet the huge outlays that appear inevitable, the only way to avoid currency tinkering is higher taxation. The latter seems altogether probable.

It is also understood that careful study is being given to the future of the Public Works Administration. It seems certain a further PWA appropriation will be asked and granted. The PWA has practically exhausted the second large appropriation made for it and while results in stimulating the capital goods and other industries have been distinctly disappointing, it is apparently the conviction that another large appropriation will have to be made. Its amount evidently has not been determined upon. Some members of Congress would appropriate an almost limitless sum, from $5,000,000,000 up, and it is said that some Administration officials are in favor of an appropriation of the former amount.

Social Legislation Likely

Meanwhile the President has named a special council to assist in the preparation of a social legislation program to include such matters as unemployment insurance, old-age pensions and related subjects. The council was selected from industrial, economic, labor and agricultural interests and is headed by Frank P. Graham, president, University of North Carolina. The Advisory Council will cooperate with the Committee on Economic Security which has studied the problems involved. It also has been studied by a committee made up of Secretary Perkins, chairman; Secretary Morgenthau; Attorney General Cummings; Secretary Wallace, and Harry L. Hopkins, Federal Relief Administrator.

Change in Relief Program

Distinct change may be made by the Administration in its relief program. Instead of giving outright relief, it is understood the President is having a study made of a program looking to a guarantee to industry against losses if production is speeded up which necessarily would take unemployed off payrolls and put them to work. The view is taken that this would increase purchasing power through wages that now do not exist, that business would be stimulated and actually that the Government guarantee, or subsidy as some have called it, would not involve much loss, or in any event a loss that would be less than is represented by the present huge relief outlays.

A plan formerly suggested and made known would shift unemployed from the direct dole to relief work. Still another proposal said to be under consideration is the lending of lump sums to families in sufficient amounts to take them off the payrolls. All of these expedients, whatever their merits, reflect the earnest efforts the Administration is making to bring employment back and to pare down relief rolls and also the growing realization of the necessity of turning more to private industrial activity instead of at present depending upon Federal funds which directly and indirectly are the leverage on which a large part of the industrial activity of the country depends at present.

Committee on Enonomic Security To Discuss Policies This Week

WASHINGTON, Nov. 13.—Plans for social legislation at the approaching session of Congress will be made by the Administration at conference here on Wednesday and Thursday of the present week of the President's Committee on Economic Security. Data bearing on the subject of financing unemployment insurance through reserves have been compiled by a committee and are expected to be presented at the session. Means of shaping a policy will be discussed. Difficulties such as those relating to constitutional limitations will be taken into account. This particular feature was a matter of a great deal of opposition at the last session of Congress when the Wagner bill was introduced. Proponents of the legislation have suggested as a possible solution the setting up of uniform standards for the States which would be called upon to provide unemployment reserves.

The plan of Secretary of Labor Frances Perkins would call for assessments upon industry according to seasonal operations. Industries with the more constant operations and employment would be required to contribute less to unemployment reserves than would industries whose seasonal fluctuations vary widely. This proposal has been urged by supporters as a means of not only building up unemployment reserves but also to level out production and maintain employment more steadily. This is reported to be under consideration in connection with the study ordered by President Roosevelt when he extended the automobile code. He asked that investigation be made as to seasonal employment as well as to wages and hours.

It is, of course, a subject that has been considered for many years by all important industries. As yet they have discovered no way of regulating consumer demand whereby balance between production and consumption over the year may be established.

Unemployment Problems Uppermost

The absorption of the tremendous unemployment rolls lies back of the entire problem. It is only one aspect of efforts being made by the Administration to reduce relief rolls and huge expenditures for this purpose. The mounting costs as well as growing unemployment in the face of the approaching winter are a matter of increasing concern. It is clear that the Administration is taking a more practical viewpoint on these questions than was reflected in advice given earlier on some legislative programs now in effect. For the committee to report on social insurance, old age pensions, and sickness includes practical men who are aware of the difficulties of the problems involved.

Another means of getting the unemployed back to work said to be under consideration would be stimulation of production with a Government guarantee against loss to industry. This strange proposal of subsidizing industry has been urged in the past by some economists, but how seriously it may be taken into calculation by the Administration is not known. Those who have advocated the plan have suggested it as a substitute for publicly financed construction.

There appears reason for believing the proposal has been given consideration by the Administration. At least the hint seems to have been given in

a recent address by Donald Richberg, when he inquired:

"Will private enterprise undertake now the great and necessary task of reemploying at least 4,000,000 to 5,000,000 willing workers or must the Federal Government undertake to bring this about, either indirectly through underwriting private activities or directly through the expansion of self-liquidating projects?"

Cost to Government Less

The contention has been made that the cost to the Government through guarantees to industry against loss would be less than the present staggering cost of relief. Nevertheless, the plan has raised many questions. Would the guarantee be made for all industries or for only certain ones? Would political considerations inevitably find their way into the plan? Would demands for Government guarantees reach impossible proportions? Assuming the purchasing power desired would be built up to consume great quantities of goods, would not the Government outlay be in excess of benefits derived? Would such a method actually build up demand for products of the durable goods industries where the greatest unemployment exists? How can the Government, through "experts" or others, work out the plan for determining the normal demand for staple commodities? Would huge inventories be built up with no markets? And finally, would not the cost fall back upon the industries themselves through taxes? To many at least, the proposal is held to be entirely impractical and to smack strongly of a plan Russia so far has found to be unworkable.

They feel that the Government would do well to give greater encouragement to private industry. Loosening of private credit, encouragement to the long term bond market through the elimination of restrictive Government supervision, a decided let-up in the present turmoil of labor troubles, greater assurance as to the currency program and moves toward reduction in tremendous Government expenditures as much and as soon as possible, are some of the suggestions offered.

The Museum of Science and Industry in Chicago has installed complete equipment, including material handling hoist for a permanent exhibit of industrial welding which was presented to the institution by the Harnischfeger Corpn., Milwaukee. The exhibit is an ingenious one, for with the demonstrations carried on behind a special colored glass, visitors are able to see at close range the technique employed in various types of welding without blinding glare.

Federal Reserve and RFC Severely Criticized for Stringent Credit Policies

WASHINGTON, Nov. 13.—Dealing entirely with credit from banks and other financial sources, a report by Dr. Theodore N. Beckman, Ohio State University economist, so severely criticised the Federal Reserve Board and the Reconstruction Finance Corpn. policies as they affect loans to small enterprises that it has created a stir within New Deal circles.

Although Dr. Beckman was placed in charge of the survey made by the small industries committee of the Business Advisory and Planning Council and conducted it under the auspices of the Bureau of the Census, Department of Commerce, Acting Secretary of Commerce Dickinson attached a statement to the report saying it was issued last Friday through a mistake. Dr. Dickinson declared that in its present stage, the report "represents nothing but the views of Dr. Beckman" and is "not in any sense an official publication of the Department of Commerce, nor does it represent the views of the department." It is understood that the report was prematurely mailed out through an oversight.

Certain it is that the document was notable for its clarity, directness, and factual statements. While strong language was used, there was an absence of discernible rancor or bias and for that reason the report was impressive. It was distinctly not "just another report."

Consisting of 20 mimeographed pages, numerous recommendations were made to loosen credit requirements of small industry for recovery, the subject of the report.

Banking Suggestions Interesting

Among outstanding recommendations made was one for legislation "to coordinate and unify the commercial banking system so as to eliminate free competition in banking, lax and divergent supervision and strong local influences." To this end, Dr. Beckman recommended encouraging banks to join the Federal Reserve System and coordination of all such banking under the system. To accomplish the first step, Dr. Beckman said Congress should amend the Federal Deposit Insurance act to require all banks operating under this act to become members of the Federal Reserve system and to make bank operation without the benefit of Federal Deposit Insurance unprofitable by placing a sufficiently heavy tax upon such operations. Recommendation also was made for the establishment of 12 regional intermediate credit banks to be dominated by a central credit bank.

Dr. Beckman sharply attacked the Reconstruction Finance Corpn., as well as the Federal Reserve banks, for failure to meet the emergency in order to serve small industries. Modification of the securities act to make security flotations easier for small concerns was recommended. Legislation was asked to establish an intermediate bank system with the central bank in New York, to be managed by a board of directors. Its funds would be obtained from a $100,000,000 stock issue to be purchased by the Treasury while another $100,000,000 would be subscribed by the Treasury and the issue and sale of collateral trust debentures. Loans to the 12 regional banks would be made by the central bank which would issue and supervise all rules and regulations, the regional banks to be in the 12 Federal Reserve cities. Direct loans would be made to industrial and commercial enterprises by the regional banks which would also discount paper for banks and trust companies when coming from intermediate loans to industry and trade. Regional bank borrowers would subscribe to central bank stock to at least 5 per cent of the loan, interest rates charged by regional banks to be at least 1 per cent higher than the rediscount rate by the central bank but not less than 3 per cent nor more than 6 per cent.

More Liberal Federal Reserve Policy

In asking for a more liberal policy by the Federal Reserve Board, Dr. Beckman recommended that bank examiners be instructed to stop marking as slow loan, notes now held by banks and made by small manufacturing establishments of character which are properly secured. Also he asked that the examiners be instructed to "consider the stable character of small manufacturing establishments when auditing bank records with a view to extending rather than restricting credit." He recommended that the examiners cease "their insistence upon loans of a self-liquidating nature until such time as new and permanent sources of intermediate-term credit are made available." Recommendation was made that examiners be instructed to obtain the viewpoint of industrialists in carrying out their duties and "not maintain only the financial outlook" and that provision be made to supervise the activities of bank examiners to assure compliance with these regulations rather than to leave the matter to their individual discretion.

The report said that in nine of the Federal Reserve districts the percentage of borrowing manufacturers experiencing credit difficulty was over 40 and in no district, it was stated, did this fall below 32 per cent. Practically every phase of American in-

dustrial life was said to be affected by the restrictive financial structure. It was declared that of the 1964 manufacturers reporting credit difficulty, 1253 estimated that they would need during the present year $50,915,000 to meet maturing obligations, 517 estimated they will require $14,779,000 during 1935 for the same purpose.

"Annual estimated requirements were thus made through 1938," Dr. Beckman reported. "Projection of these estimates to include all manufacturers of similar size and position in the United States indicates over $2,000,000,000 will be required during the five-year period from 1934 through 1938 by manufacturers employing from 21 to 250 wage earners to meet maturing obligations already contracted at the close of 1933 and those expected to be incurred under normal operations. Assuming that the average length of these loans is at the medial between one and five years, a revolving fund of at least $1,100,000,000 would be required to meet anticipated needs of small manufacturers having credit difficulty. In addition, they will require funds for working capital, the amount of which could not even be approximated from the data now available."

Citing especially the high financial soundness of concerns which sought loans in vain, Dr. Beckman referred to the situation as "an economic mystery of mysteries, and "a financial puzzle that baffles the sincerest thought."

Small Manufacturers Complain

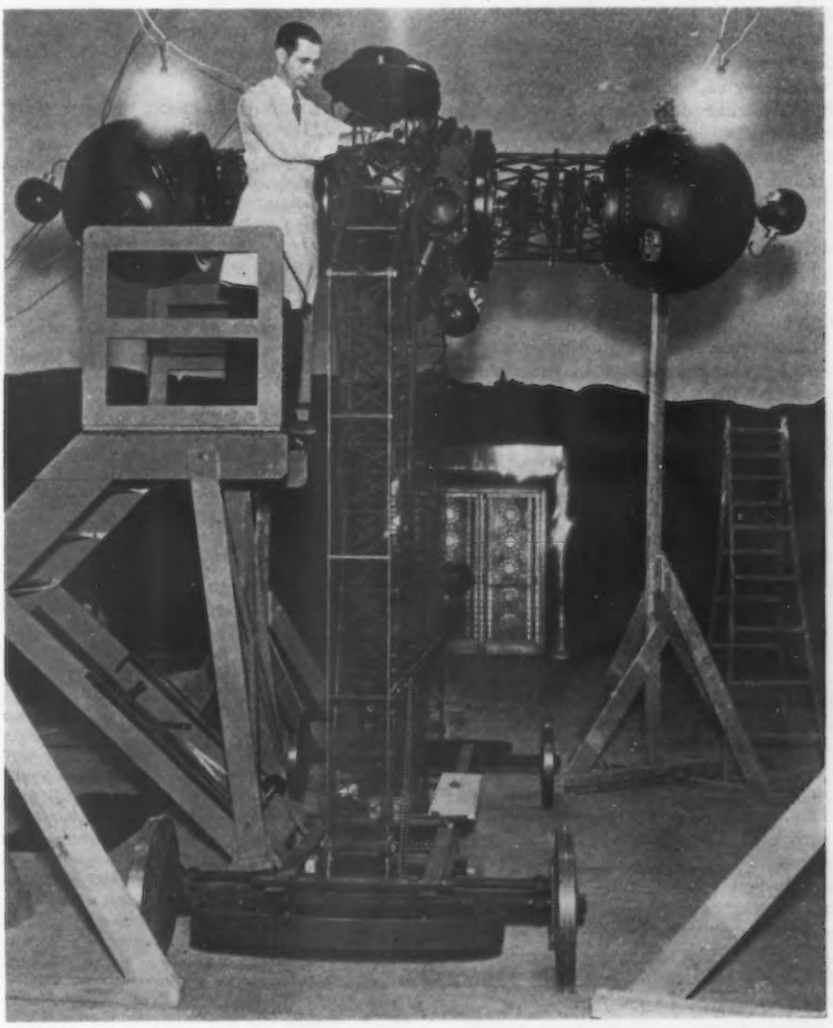
Dr. Beckman said criticism of the inadequacy of the present sources of capital credit was received from a large number of small manufacturers. Contrary to what might have been expected, he stated, serious criticisms were advanced by all classes of manufacturers regardless of whether they had credit difficulty or whether they customarily borrowed. Criticisms were declared to have been principally leveled against the sudden changes in bank policy, the attitude of bank examiners, the failure of the Federal Reserve System to meet the situation and "the utter collapse of the Reconstruction Finance Corpn. as a means of direct aid to industry."

Critics, it was stated, contend "that the mania for liquidity on the part of certain bankers, fostered by Federal bank examiners, is largely responsible for the failure of other heroic efforts on the part of the present Administration to bring prosperity out of chaos. They further contend that the amassing of large sums in the hands of bankers without distribution of these monies to industry through loans reduces employment, restricts production, and curtails consumption."

The report also pointed out that such New Deal legislation as the Glass amendment to the Federal Reserve act and the industrial loan amendment to the RFC act are not put into effect by those responsible for their enforcement, "because they, too, are bankers and can not or will not use the discretionary powers envisioned by the Administration and Congress to assist industry."

"That there is justification for some of this criticism," said Dr. Beckman, "is indicated by the urgent needs of small industry as viewed by the manufacturers themselves. Many reported unfilled orders now on hand for which working capital can not be secured. Others required funds to purchase machinery and equipment, to expand their plants, conduct sales campaigns, etc. Still others require funds to continue their whole-hearted compliance with the National Recovery Administration codes which necessitate increased employment and purchase of raw materials at higher costs. Indeed, in many cases the urgency of immediate credit aid is so great that some firms, with large unfilled orders already on hand, face complete shut-down of their plants with consequent unemployment and bankruptcy."

Electric furnace iron will be the subject for discussion at a special meeting of the Detroit chapter of the A.S.M.E. on Nov. 22 in the high school auditorium at Ecorse, Mich. R. G. McElwee, general manager, Ecorse Foundry Co., will give a paper on "Modern Cast Iron" and written discussions will be contributed by A. L. Boegehold, General Motors Research Laboratories; R. H. McCarroll, Ford Motor Co.; and E. W. Upham, Chrysler Corpn. Professor A. E. White of the University of Michigan will be chairman of the meeting.



Steel and the Stars

BY means of this projector, moving replicas of all of the known heavenly bodies will be thrown upon an artificial sky in the new planitarium of the Griffith observatory at Los Angeles, Cal. Steel even makes the stars go 'round!

Amendment to Gray Iron Foundry Code Approved — Other Developments

WASHINGTON, Nov. 13.—The National Industrial Recovery Board has approved an amendment to the code of fair competition for the gray iron foundry industry, incorporating in the code standard clauses suggested by the NRA with respect to the filing with a confidential and disinterested agent of the code authority, of identified lists of prices, discounts, rebates and other terms and conditions of sale, known as "price terms."

Authorization is given by the amendment for such filings when 75 per cent of the tonnage of members of any agency or territorial division, form a group in accordance with terms of the code. It is further stipulated that whenever any member of the group has filed a revision of "price terms," such member shall not file a higher price within 48 hr. The related standard clauses dealing with the subject of "price terms" are included in the amendment. A further amendment incorporates in the code the NRA's standard clauses regarding wilfully destructive price cutting which is declared to be an unfair method of competition and is forbidden.

The emergency conditions under which a stated minimum price for a specified product for a limited period may be permitted are set forth in the amendment. Such emergency conditions require that an investigation of conditions be made by the code authority through an impartial agency, and the promulgation of a stated minimum price is subject to the approval of the NIRB.

The NIRB has denied applications of the Baldwin Locomotive Works, Philadelphia, and of the code authority for the machinery and allied products industry, for exemption from the provision of the gray iron foundry industry's code forbidding selling below cost. "Both applicants for exemption objected to defining costs by the gray iron foundry industry's uniform cost and estimating system. The board was told by the deputy administrator in charge of the code that this requirement does not work a hardship, since the code provision permits use of any recognized system which conforms to the essentials of the industry's system.

Suggestions or objections concerning a proposed budget of $128,120 for Jan. 1, 1935, to Dec. 31, 1935, and a basis of contribution for the gray iron foundry industry's code authority must be submitted to Deputy Administrator W. W. Rose, Washington, before Nov. 28. Contribution will be on the basis of 0.2 per cent of the sales for 1933—that is $2 per year per $1,000 of sales, or 50c. per quarter per $1,000 of sales. Any member of the industry who was not in business during 1933 will be assessed on twice his first six months' sales for 1934 at the rate of two-tenths of 0.2 per cent per year, assessments to be made quarterly in advance.

DROP FORGING

A budget of $85,000, estimated for administering the code for the drop forging industry from Oct. 1, 1934, to June 16, 1935, has been submitted for NRA approval. Objections or suggestions must be filed with Deputy Administrator W. W. Rose, Washington, before Nov. 19. The code authority suggests that industry members be assessed not more than 4/10 of 1 per cent of their net sales volume for the second month preceding the month of assessment.

CANNING AND PACKING MACHINERY AND EQUIPMENT

The code authority for the canning and packing machinery and equipment industry has made application for termination of exemption to contribute to code administration for members of the industry whose principal line of business is embraced in a trade or industry subject to another code. Objections or suggestions concerning this application must be submitted to Deputy Administrator Neal W. Foster, Washington, before Nov. 20.

GALVANIZED WARE MANUFACTURING

The terms of payment set by the supplementary code for the galvanized ware manufacturing industry have been modified for six months by an order of the National Industrial Recovery Board.

The supplementary code prescribes a maximum cash discount of 2 per cent for payment ten days from date of invoice, and 60 days net. The modifying order, staying this provision for six months, permits a 2 per cent discount for payment 10 days from end of month succeeding date of invoice, on domestic sales, and a 2 per cent discount for payment within 10 days after receipt of documents, on export sales.

REFRIGERATING MACHINERY

A hearing will be held Nov. 21 in Washington on the electrical manufacturing industry's application for a stay of the refrigerating machinery industry's supplementary code so far as it applies to the electrical manufacturing industry. Deputy Administrator Beverly S. King will be in charge. The Electrical Manufacturers' Association contended it was not represented in preparing the refrigerating machinery industry's code, which is supplementary to the code for the machinery and allied products industry. The supplementary code will not apply to the electrical manufacturing industry, pending the result of the hearing.

MECHANICAL SCALE REMOVING

An amendment to add the "mechanical scale removing subdivision" to the subdivisions under the code for the machinery and allied products industry will be considered at a public hearing at the Willard Hotel, Washington, on Nov. 27. Firms making or designing powered apparatus for removing scale, rust, carbon or other deposits from tubular metal surfaces could come under the subdivision and the machinery and allied products code, according to the amendment. It excludes products manufactured under any other code.

WIRE ROPE AND STRAND MANUFACTURING

Suggestions or objections concerning an amendment to the supplementary code for the wire rope and strand manufacturing industry authorizing the supplementary code authority to prepare and administer a budget, must be submitted before Nov. 15 to Deputy Administrator H. Ferris White, Washington. The amendment has been approved and will become effective Nov. 15 unless cause to the contrary is shown.

FLEXIBLE METAL HOSE AND TUBING

Suggestions or objections concerning an amendment to the supplementary code for the flexible metal hose and tubing manufacturing industry, requiring contributions to the supplementary code authority's budget, must be submitted before Nov. 15 to Deputy Administrator H. Ferris White, Washington. The amendment has been approved and will become effective Nov. 15, unless cause to the contrary is shown.

INDUSTRIAL SUPPLIES AND MACHINERY DISTRIBUTION

The NRA has announced that objections or suggestions concerning the code authority budget for the industrial supplies and machinery distributors' trade must be filed by Nov. 30 with Division Administrator Robert L. Houston, Washington. The budget amounts to $25,000 is for the period from Dec. 8, 1934, to Dec. 7, 1935. The basis of contribution is 0.40 per cent of sales.

LOCOMOTIVE APPLIANCE

Objections or suggestions concerning the addition of two fair trade practice provisions to the code for the locomotive appliance industry subdivision of the machinery and allied products industry must be submitted to Deputy Administrator W. W. Rose, Washington, before Nov. 30. One provision would provide that, during the time a manufacturer or his successor is producing an article which has required special designing, research or development expense, other manufacturers making a substitute replacement part would be required to mark the name of the maker on the product "so that the ultimate user is clearly informed that the part was not manufactured by the original maker." The other addition would prohibit members from furnishing to purchasers working drawings showing more details than are customarily shown.

ALUMINUM WIRE AND CABLE

The NIRB has approved an interpretation holding that the manufacture of aluminum wire and cable is subject to the code for the aluminum industry and that it is not subject to the code for the electrical manufacturing industry. An interpretation was requested by the code authority of both industries to settle the question of jurisdiction. The interpretation follows:

GALVANIZED WARE MANUFACTURING

The terms of payment set by the supplementary code for the galvanized ware manufacturing industry have been modified for six months by an order of the National Industrial Recovery Board.

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10 days from date of invoice, and 60 days net. The modifying order, staying this provision for six months, permits a 2 per cent discount for payment 10 days from end of month succeeding date of invoice, on domestic sales, and a 2 per cent discount for payment within 10 days after receipt of documents, on export sales.

METALLIC WALL STRUCTURE

The National Recovery Administration has announced that a group of code amendments for the metallic wall structure industry, a division of the fabricated metal products industries, has been approved. The changes include a provision eliminating the National Steel Partition Association as the code's accepted "association," and substituting the "National Metallic Wall Structure Association."

SHOVEL, DRAGLINE AND CRANE

The Shovel, Dragline and Crane Industry will have a budget total of $18,998 for July 1, 1934, to Dec. 31, 1934; the basis of contribution is $1.50 per $1,000 of total net sales for 1933. Objections must be filed by Nov. 24 with Deputy Administrator Neal W. Foster, Washington.

CODE AUTHORITY MEMBERSHIPS

The NRA has announced recognition of the following code authority memberships:

Copper and Brass Mill Products Industry: Alternate members—W. M. Goss, Scovill Mfg. Co., Waterbury, Conn., alternate to E. O. Goss; R. L. Coe, Chase Brass & Copper Co., Waterbury, alternate to F. S. Chase; J. A. Doucett, Revere Copper & Brass, Inc., New York, alternate to C. D. Dallas; F. E. Weaver, American Brass Co., Waterbury, alternate to John A. Coe; H. W. Steinkraus, Bridgeport Brass Co., Bridgeport, Conn., alternate to R. E. Day; L. E. Strasburg, Mueller Brass Co., Port Huron, Mich., alternate to F. L. Riggin. Alternate to J. P. Lally has not been chosen.

Pulp and Paper Mill Wire Cloth Manufacturing Industry: G. M. Peterson, Cheney Bigelow Wire Works, Springfield, Mass.; Paul O'Neill, Jos. O'Neill Wire Works, Inc., Port Chester, N. Y.; H. G. Specht, Eastwood-Nealley Corp., Belleville, N. J.; Guy A. Disbro, The W. S. Tyler Co., Cleveland; John D. Watson, Wisconsin Wire Works, Appleton, Wis.; Edward Docherty, Holyoke Wire Cloth Co., Holyoke, Mass.; R. K. McCluskey, H. & T. McCluskey & Sons, Inc., New Haven, Conn.

Tubular Split and Outside Pronged Rivet Manufacturing Industry: F. H. Merwin, Milford Rivet & Machine Co., Milford, Conn.; J. A. Morrissey, Chicago Rivet & Machine Co., Cicero, Ill.; William P. Bartel, Judson L. Thomson Co., Waltham, Mass.; John Marshall, Tubular Rivet & Stud Co., Boston; William Fleming, Jr., National Rivet & Mfg. Co., Waupun, Wis.

Envelope Machinery Manufacturing Industry Division of Machinery and Allied Products: Edgar A. Smithe, F. L. Smithe Machine Co., Inc., New York; Edgar P. Vierengel, M. Vierengel Machine Co., Inc., Brooklyn; P. W. Chapman, Lester & Wasley Co., Inc., Norwich, Conn.

Oil Field Pumping Engine Subdivision of Machinery and Allied Products: C. Paul Clark, Clark Bros. Co., Olean, N. Y.; Arthur Clifford, Sr., Weber Engine Co., Kansas City; H. L. Hileman, Joseph Reid Gas Engine Co., Oil City, Pa.; T. F. Hudgins, Cooper-Bessemer Co., Mount Vernon, Ohio; Emil Opferkuch, National Superior Co., Springfield, Ohio; H. J. Renken, Fairbanks, Morse & Co., Chicago; J. J. MacKinney, Butler Engine & Foundry Co., Butler, Pa.

Chemical Engineering Equipment Subdivision of Machinery and Allied Products Industry: John V. N. Dorr, Dorr Co., New York; H. D. Miles, Buffalo Machine & Foundry Co., Buffalo; William E. Hall, Duriron Co., Dayton, Ohio; C. L. Campbell, E. B. Badger & Sons Co., New York; Percy Kingsbury, General Ceramics Co., New York; M. J. Sayles, Independent Filter Press Co., Brooklyn; James E. Moul, Turbo-Mixer Corpn., New York; D. W. Sowers, Sowers Mfg. Co., Buffalo; S. F. Spangler, Chemical Construction Corpn., New York; Arthur Wright, Arthur Wright & Associates, New York; Franklin Wedge, Electro-Chemical Supply & Engineering Co., Paoli, Pa.

Copper, Brass, Bronze and Related Alloys Trade (division of the wholesaling or distributing trade): Members of associations—C. H. Krueger, Chase Brass & Copper Co., New York; Joseph Stelwagon, Stelwagon Mfg. Co., Philadelphia, and J. J. Whitehead, Whitehead Metal Products Co., New York. Non-Members of associations—J. P. Lally, C. G. Hussey & Co., Pittsburgh, and H. V. Steinkraus, Bridgeport Brass Co., Bridgeport, Conn.

Alloys Industry: To represent members of industry not members of the American Alloys Producers Association, Fred W. Cohen, Metal & Thermit Corpn., New York.

Steel Plate Fabricating Industry: J. H. Brillhart, Fort Worth Structural Steel Co., Fort Worth, Tex., and William S. Wheeler, Pennsylvania Engineering Works, New Castle, Pa., to represent those not members of the Steel Plate Fabricators Association.

Boiler Manufacturing Industry: Starr H. Barnum, Bigelow Co., New Haven, Conn.; Owsley Brown, Springfield Boiler Co., Springfield, Ill.; M. E. Finek, Murray Iron Works, Burlington, Iowa; E. C. Hutchinson, Edge Moor Iron Co., Edge Moor, Del.; W. F. Keenan, Jr., Foster Wheeler Corp., New York; H. B. Kendall, M. W. Kellogg Co., New York; R. B. Mildon, Westinghouse Electric & Mfg. Co., Philadelphia; A. G. Pratt, Babcock & Wilcox Co., New York; A. W. Strong, Strong-Scott Mfg. Co., Minneapolis; A. C. Weigel, Combustion Engineering Co., New York.

Alloys Industry: Association members—A. A. Corey, Jr., Vanadium Corpn. of America, New York; W. F. Meredith, Titanium Alloy Mfg. Co., New York; J. M. Price, Electro Metallurgical Sales Corpn., New York; F. P. Gormely, Electro Metallurgical Co., New York; Paul Kruesi, Southern Ferro Alloys Co., Chattanooga, Tenn.; L. G. Pritz, Ohio-Ferro Alloys Co., Canton, Ohio, and Max Schott, Climax Molybdenum Co., New York.

Mechanical Press Manufacturing Subdivision, Machinery and Allied Products Industry: W. R. Beatty, Beatty Machine & Mfg. Co., Hammond, Ind.; L. H. Carter, Toledo Machine & Tool Co., Toledo, Ohio; R. W. Glasner, Clearing Machine Corpn., Chicago; J. F. Herkenhoff, Minster Machine Co., Minster, Ohio; H. U. Herrick, V. & O. Press Co., Hudson, N. Y.; G. R. Munschauer, Niagara Machine & Tool Works, Buffalo; W. C. Sayle, Cleveland Punch & Shear Works Co., Cleveland; F. K. Simmons, Henry and Wright Mfg. Co., Hartford, Conn.; C. T. Ziegler, General Machinery Corp., Hamilton, Ohio.

TRADE PRACTICE COMPLAINTS COMMITTEES

The NRA has announced approval of organization of trade practice complaints committees for the following industries:

Sewing Machinery Industry: Walter Borenstein, Central Sewing Machine Co., and chairman rebuilders' divisional code authority, New York; Joseph L. Ray, Singer Sewing Machine Co., New York; A. S. Rodgers, White Sewing Machine Corpn., Cleveland; Franklin A. Reece, Reece Button Hole Machine Co., Boston; J. P. Weis, Metropolitan Sewing Machine Corpn., Nyack, N. Y.; Milton C. Lightner, chairman of code authority, ex-officio; Col. Willard Chevalier, administration member of code authority, member of committee without vote; E. W. Osann, secretary of the code authority, executive secretary of trade practice complaints committee.

Scrap Iron, Nonferrous Scrap Metals and Waste Materials Trade (Scrap Iron and Steel Trade): M. V. Bonomo, Schiavone-Bonomo Corpn., New York, chairman; Dan R. Cohen, D. R. & F. A. Cohen, Chicago, secretary; Joseph V. Kiley, T. J. Kiley & Son, Boston; Samuel Appel, Samuel Appel Co., Fort Wayne, Ind.; Saul Brown, N. Brown & Sons Co., Pittsburgh.

Steel Joist Industry: Committee to consist of members of the code authority.

Wire, Rod, and Tube Die Industry: S. M. Tracy, Driver-Harris Co.; F. Durand, Cochaud Wire Die Corpn.; M. Harris, Newark Wire Die Co.; Lt.-Col. H. K. Rutherford, administration member.

Anti-Friction Bearing Industry: W. E. Umstattd, Timken Roller Bearing Co., Canton, Ohio; F. G. Hughes, New Departure Mfg. Co., Bristol, Conn.; A. C. Davis, Marlin-Rockwell Corpn., Jamestown, N. Y.; E. R. Wakefield, secretary code authority, New York; G. A. Strom, Strom Steel Ball Co., Cicero, Ill.; H. A. Schatz, Federal Bearing Co., Poughkeepsie, N. Y.; F. C. Burkholder, Ahlberg Bearing Co., Chicago.

Galvanized Ware Manufacturing Industry: D. S. Hunter, Cleveland, duly authorized agent, a committee of one to handle trade practice complaints.

Safety Razor and Safety Razor Blade Manufacturing Industry: Jean U. Koree, Norwalk Safety Razor Co., New York; G. B. Lambert, Gillette Safety Razor Co., Boston; A. J. Lindblad, Utility Blade Corpn., Maplewood, N. J.; Louis Siegal, Siegal Safety Razor Co., New York, and P. H. Unsinger, Unsinger Cutlery Co., Newark, N. J.

Pulp and Paper Mill Wire Cloth Manufacturing Industry (a division of the fabricated metal products industry): G. M. Peterson, Cheney Bigelow Wire Works, Springfield, Mass.; Paul O'Neill, Joseph O'Neill Wire Works, Port Chester, N. Y.; H. G. Specht, Eastwood-Noalley Corpn., Belleville, N. J.; Guy Disbro, The W. S. Tyler Co., Cleveland; John D. Watson, Wisconsin Wire Works, Appleton, Wis.; Edward Docherty, Holyoke (Mass.) Cloth Co., and R. K. McCluskey, H. & T. McCluskey & Sons, Inc., New Haven, Conn., all code authority members.

Machine Screw Nut Manufacturing Industry (a division of the fabricated metal products industry): The Supplementary code authority members.

Complete Wire and Iron Fence Manufacturing Industry (a division of the fabricated metal products industry): Committee to consist of seven members appointed by the supplemental code authority.

Corrugated Rolled-Metal Culvert Pipe Industry: E. B. Abbett, Newport Culvert Co., Newport, Ky.; S. R. Ives, Armco Culvert Association, Middletown, Ohio; F. A. Kelly, Toncan Culvert Association, Youngstown; J. P. Dolan, Penn Culvert Co., Cambridge, Mass., and J. H. Robinson Wheeling Corrugating Co., Wheeling, W. Va.

Hand Chain Hoist Manufacturing Industry: D. S. Brisbin, Chisholm Moore Hoist Corpn., Tonawanda, N. Y.; A. M. Harrington, Harrington Co., Philadelphia; L. D. Cull, David Round & Son, Cleveland; C. S. Neumann, Union Mfg. Co., New Britain, Conn.; J. C. Morgan, Yale & Towne Mfg. Co., Philadelphia; A. P. Van Schaick, Wright Mfg. Division, American Chain Co., Bridgeport, Conn.

Low Bidders Announced On Large Federal Jobs

WASHINGTON, Nov. 13.—James Stewart & Co., Inc., New York, was low bidder on the proposed Federal office building for New York, based on limestone construction, while based on granite construction, the low bidder was the George F. Driscoll Co. The building, to be of nine, ten or eleven stories, will require from 16,000 to 18,000 tons of steel. Bids were opened last Friday.

The Aermotor Co., Chicago, was low bidder on 69 towers, involving 520 tons of shapes, bars, angles, etc. The bids were opened last Friday by purchases and sales section, Department of Agriculture.

The Newport News Shipbuilding & Dry Dock Co. has been awarded a contract at $467,930 for a hydraulic turbine for Norris dam being built by the Tennessee Valley Authority. The Baldwin-Southwark Corpn., Philadelphia, was awarded a contract at $339,400 for a turbine for Wheeler dam, also part of the TVA project.

Allotment has been made by PWA of $1,772,300 for the installation of 32 elevators and other requirements in the Municipal Building, New York. An allotment of $494,000 also has been made to New York for the construction of a three-story and basement fireproof nurses' home at the Sea View Hospital in Richmond, the approximate cost of materials being $478,400.

Other allotments announced follow:

Raleigh, N. C., $350,000, hospital building; Camden, N. J., $124,000, water supply system; Shaler Township, Pa., $414,000, waterworks system; Richmond, Va., $130,000, heating plant; Kearney, N. J., $310,000, school building; Norfolk, Va., $119,000, highway bridge; Teaneck, N. J., $635,000, school addition; Danville, Va., $319,500, schools; Penn Township, Pa., $335,000, school building; Beatrice, Neb., $575,000, electric distribution system; Freeport, Ill., $291,000, sewer; Indianapolis, $3,000,000, slum clearance, including 39 projects, made up of 15 apartments and 92 row houses, for negro occupancy.

Among PWA loan and grant allotments for non-Federal construction projects which have been rescinded are the following:

San Bernardino, Calif., $350,000, to San Bernardino Valley Union Junior College district for construction of auditorium, gymnasium and technical building; election covering bond issue failed to carry.

Hempstead, N. Y., $650,000, to school district No. 1 for construction of additions to several school buildings; applicant has already sold its bonds locally and does not wish to apply for grant.

Saratoga County, N. Y., $250,000, for construction of sanatorium building at County Tuberculosis hospital; applicant failed to execute its loan and grant agreement within time specified for such action.

St. Cloud, Minn., $1,229,000, for construction of electric generating and distribution system; election for bond issue failed to carry.

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HERE is a six-ton mechanical brain, designed to solve all of the difficult problems in higher mathematics. It is known as a "differential analyzer" and will do in 15 minutes work that would keep five mathematical experts busy for four months. We respectfully commend this machine to the brain trust.

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British Iron and Steel Output Up in October

LONDON, Nov. 13 (*By Cable*).—Production of steel ingots in Great Britain rose to 812,000 tons during October, the highest level since March. September output was 734,700 tons, while production in October, 1933, was 668,300 tons.

Pig iron output also increased, having amounted to 527,100 tons, compared with 500,300 tons in September and with 373,300 tons in October, 1933.

Monthly production of pig iron and steel ingots in Great Britain during 1933 and the first 10 months of 1934 was as follows:

1933	Pig Iron	Steel Ingots
Jan.	286,600	444,400
Feb.	270,800	482,700
March	332,200	577,700
April	324,700	509,600
May	339,900	599,600
June	345,600	568,800
July	343,900	567,500
Aug.	362,700	551,300
Sept.	359,700	669,000
Oct.	373,300	668,300
Ten months	3,338,700	5,638,900
Nov.	374,900	695,000
Dec.	409,300	668,900
	4,123,600	7,002,800
1934		
Jan.	441,300	711,000
Feb.	414,400	707,500
March	503,600	829,700
April	496,300	716,800
May	529,900	780,000
June	515,700	757,500
July	527,200	718,200
Aug.	503,300	667,000
Sept.	500,300	734,700
Oct.	527,100	812,000
Ten months	4,959,100	7,434,400

Electro Lift, Inc., 30 Church Street, New York, manufacturer of monorail electric hoists and cranes, has moved its plant to Bloomfield, N. J., where larger manufacturing facilities are available. The larger facilities will be used to manufacture not only electric hoists, but also hand and electric bridge cranes, jib and other cranes. Located within the New York metropolitan area, the company is in a position to make quick deliveries by truck to all points around New York, as well as rail shipments to more distant points.

Expansion in Steel Output Is Hesitant and Uneven

Declines in Some Producing Centers Partly Offset Gains in Others—Automotive Demand Is Slow in Materializing

WITH production still rising and scrap displaying increasing strength, the outlook in the iron and steel market remains favorable. Expansion in output, however, has been hesitant, with declines in some producing centers partly offsetting advances in others, and the net gain in operations has been only one-half a point to 27 per cent of capacity.

Expected orders from the automobile industry have been slow in materializing. In fact, a rise of one point to 31 per cent in steel output in the Chicago district was due almost solely to heavier demand from farm equipment makers. At Cleveland, where mills are mainly dependent on automotive tonnage, ingot production has declined seven points to 32 per cent. Other changes in operating rates include a drop of one point to 23 per cent in the Philadelphia district and gains of four points to 30 per cent in the Valleys and five points to 41 per cent in the Wheeling area. The average for the important Pittsburgh district remains at 18 per cent for the fourth week.

THE slow appearance of automotive tonnage is due in part to continued experimentation with trial lots of material to determine the most suitable specifications and sizes for the new models about to be introduced. Another plausible explanation of current delays is the reluctance of leading motor car makers to make final moves in advance of their competitors. Meanwhile, automobile production is lagging and output for this month will not exceed 70,000 assemblies.

Price considerations are also causing the automotive trade, as well as other steel consumers, to defer purchases. While few, if any, important changes in quotations seem likely to be made for the first quarter of next year, buyers are disposed to wait until Nov. 20, the time when price filings for the next contracting period will be made. Consumers of wire products, encouraged by recent reductions in spring wire, spoke wire and basic wire, are now pressing for a revision of wire extras.

THE rise in scrap prices has been small, THE IRON AGE composite for heavy melting steel advancing from $9.71 to $9.79 a ton. Most scrap markets are lethargic in keeping with the uneven and halting improvement in steel mill operations, but the heavy melting grade has risen 25c. a ton at Pittsburgh and 50c. at Cleveland. Foreign buyers are reaching farther inland for scrap and during the current week moved a cargo from Chicago.

Railroad buying remains subnormal but may revive if current preliminary discussions result in the adoption of a comprehensive plan for Federal loans. At present the carriers are giving special attention to the improvement of passenger equipment, the latest development in this sphere being the purchase of 57 streamlined electric locomotives by the Pennsylvania, but if financing can be arranged their next move will probably be the modernization of freight equipment.

The Northern Pacific has placed tentative orders for 10,000 tons of rails and the Santa Fe is making preliminary estimates covering 160 miles of track, or about 25,000 tons.

STRUCTURAL steel awards, at 12,850 tons, compare with 7550 tons a week ago. Plate lettings total 3500 tons. Public works, long the main support of construction activity, promise to be a continuing factor in the coming year, following the expected appropriation of funds by Congress early in January. In addition, the Emergency Housing Corporation has reached a point in its activities where several large slum clearance projects can be launched. The Williamsburg project, covering a 12 square block area in Greater New York, has been authorized contingent on assurances from the city that adequate school facilities will be provided. The Federal housing program, a separate activity, is still in its initial stage.

Russia's purchases of sheets and strips from American mills now total 10,000 tons. Japanese buying growing out of the recent typhoon is likely to be restricted to European mills, 20,000 tons of steel already having been bought on a barter arrangement from Germany. Cuban demand for American nails and wire products has mounted since the conclusion of the reciprocal trade agreement. Canada has ordered 1,250,000 boxes of tin plate from Great Britain.

Ford has ordered $1,000,000 worth of machine tools and foundry equipment for the Rouge plant and will soon buy another $1,000,000 worth for Dearborn. The War Department will shortly take bids on $2,300,000 worth of machine tools.

THE IRON AGE composite prices for pig iron and finished steel are unchanged at $17.90 a ton and 2.124c. a lb.

▲▲▲ A Comparison of Prices ▲▲▲

Market Prices at Date, and One Week, One Month, and One Year Previous
Advances Over Past Week in Heavy Type, Declines in Italics

Pig Iron

Per Gross Ton:	Nov. 13, 1934	Nov. 7, 1934	Oct. 16, 1934	Nov. 14, 1933
No. 2 fdy., Philadelphia	$20.26	$20.26	$20.26	$18.26
No. 2, Valley furnace	18.50	18.50	18.50	17.50
No. 2 Southern, Cin'ti	19.13	19.13	19.13	18.13
No. 2, Birmingham†	14.50	14.50	14.50	13.50
No. 2 foundry, Chicago*	18.50	18.50	18.50	17.50
Basic, del'd eastern Pa.	19.76	19.76	19.76	17.76
Basic, Valley furnace	18.00	18.00	18.00	17.00
Valley Bessemer, del'd P'gh.	20.76	20.76	20.76	19.76
Malleable, Chicago*	18.50	18.50	18.50	17.50
Malleable, Valley	18.50	18.50	18.50	17.50
L. S. charcoal, Chicago	24.04	24.04	24.04	23.54
Ferromanganese, seab'd carlots	85.00	85.00	85.00	82.00

†This quotation is for delivery in South; in the North prices are 38c. a ton under delivered quotations from nearest Northern furnace.

*The switching charge for delivery to foundries in the Chicago district is 60c. per ton.

Rails, Billets, etc.

Per Gross Ton:				
Rails, heavy, at mill	$36.37½	$36.37½	$36.37½	$36.37½
Light rails at mill	35.00	35.00	35.00	32.00
Rerolling billets, Pittsburgh	27.00	27.00	27.00	26.00
Sheet bars, Pittsburgh	28.00	28.00	28.00	26.00
Slabs, Pittsburgh	27.00	27.00	27.00	26.00
Forging billets, Pittsburgh	32.00	32.00	32.00	31.00
Wire rods, Pittsburgh	38.00	38.00	38.00	35.00
	Cents	Cents	Cents	Cents
Skelp, grvd. steel, P'gh, lb.	1.70	1.70	1.70	1.60

Finished Steel

Per Lb.:	Cents	Cents	Cents	Cents
Bars, Pittsburgh	1.80	1.80	1.80	1.75
Bars, Chicago	1.85	1.85	1.85	1.80
Bars, Cleveland	1.85	1.85	1.85	1.80
Bars, New York	2.13	2.13	2.13	2.08
Plates, Pittsburgh	1.80	1.80	1.80	1.70
Plates, Chicago	1.85	1.85	1.85	1.75
Plates, New York	2.08	2.08	2.08	1.98
Structural shapes, Pittsburgh	1.80	1.80	1.80	1.70
Structural shapes, Chicago	1.85	1.85	1.85	1.75
Structural shapes, New York	2.05¼	2.05¼	2.05¼	1.95¼
Cold-finished bars, Pittsburgh	2.10	2.10	2.10	1.95
Hot-rolled strips, Pittsburgh	1.85	1.85	1.85	1.75
Cold-rolled strips, Pittsburgh	2.60	2.60	2.60	2.40

Finished Steel

Per Lb.:	Nov. 13, 1934 Cents	Nov. 7, 1934 Cents	Oct. 16, 1934 Cents	Nov. 14, 1933 Cents
Hot-rolled annealed sheets, No. 24, Pittsburgh	2.40	2.40	2.40	2.25
Hot-rolled annealed sheets, No. 24, Gary	2.50	2.50	2.50	2.35
Sheets, galv., No. 24, P'gh	3.10	3.10	3.10	2.85
Sheets, galv., No. 24, Gary	3.20	3.20	3.20	2.95
Hot-rolled sheets, No. 10, P'gh	1.85	1.85	1.85	1.75
Hot-rolled sheets, No. 10, Gary	1.95	1.95	1.95	1.85
Wire nails, Pittsburgh	2.60	2.60	2.60	2.10
Wire nails, Chicago dist. mill	2.65	2.65	2.65	2.15
Plain wire, Pittsburgh	2.30	2.30	2.30	2.10
Plain wire, Chicago dist. mill	2.35	2.35	2.35	2.15
Barbed wire, galv., Pittsburgh	3.00	3.00	3.00	2.60
Barbed wire, galv., Chicago dist. mill	3.05	3.05	3.05	2.65
Tin plate, 100 lb. box, P'gh	$5.25	$5.25	$5.25	$4.65

Scrap

Per Gross Ton:				
Heavy melting steel, P'gh	**$10.75**	$10.50	$10.25	$11.50
Heavy melting steel, Phila.	9.63	9.63	9.50	9.75
Heavy melting steel, Ch'go	9.00	9.00	8.75	8.75
Carwheels, Chicago	10.00	10.00	9.50	9.00
Carwheels, Philadelphia	10.50	10.50	11.25	10.75
No. 1 cast, Pittsburgh	**11.50**	11.25	11.25	11.25
No. 1 cast, Philadelphia	10.75	10.75	11.75	11.25
No. 1 cast, Ch'go (net ton)	8.00	8.00	8.00	8.50
No. 1 RR. wrot., Phila.	11.25	11.25	11.25	11.00
No. 1 RR. wrot., Ch'go (net)	8.00	8.00	7.00	7.25

Coke, Connellsville

Per Net Ton at Oven:				
Furnace coke, prompt	$3.85	$3.85	$3.85	$3.75
Foundry coke, prompt	4.60	4.60	4.60	4.25

Metals

Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Electrolytic copper, refinery‡	8.75	8.75	8.75	8.00
Lake copper, New York‡	9.12½	9.12½	9.12½	8.25
Tin (Straits), New York	51.35	51.35	50.95	55.20
Zinc, East St. Louis	3.75	3.75	3.80	4.50
Zinc, New York	4.10	4.10	4.15	4.85
Lead, St. Louis	3.45	3.50	3.45	4.15
Lead, New York	3.60	3.65	3.60	4.30
Antimony (Asiatic), N. Y.	10.50	10.50	9.50	7.20

On export business there are frequent variations from the above prices. Also, in domestic business, there is at times a range of prices on various products, as shown in detailed price tables. ‡Blue Eagle copper.

▲ ▲ ▲

▲▲▲ The Iron Age Composite Prices ▲▲▲

	Finished Steel	Pig Iron	Steel Scrap
Nov. 13, 1934	2.124c. a Lb.	$17.90 a Gross Ton	$9.79 a Gross Ton
One week ago	2.124c.	17.90	9.71
One month ago	2.124c.	17.90	9.50
One year ago	1.995c.	16.61	10.00

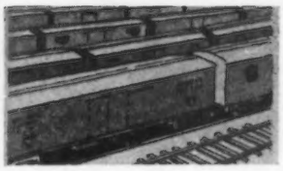
Based on steel bars, beams, tank plates, wire, rails, black pipe, sheets and hot-rolled strips. These products make 85 per cent of the United States output.

Based on average of basic iron at Valley furnace and foundry irons at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

Based on No. 1 heavy melting steel quotations at Pittsburgh, Philadelphia and Chicago.

	Finished Steel HIGH	Finished Steel LOW	Pig Iron HIGH	Pig Iron LOW	Steel Scrap HIGH	Steel Scrap LOW
1934	2.199c., April 24;	2.008c., Jan. 2	$17.90, May 1;	$16.90, Jan. 27	$13.00, Mar. 13;	$9.50, Sept. 25
1933	2.015c., Oct. 3;	1.867c., April 18	16.90, Dec. 5;	13.56, Jan. 3	12.25, Aug. 8;	6.75, Jan. 3
1932	1.977c., Oct. 4;	1.926c., Feb. 2	14.81, Jan. 5;	13.56, Dec. 6	8.50, Jan. 12;	6.42, July 5
1931	2.037c., Jan. 13;	1.945c., Dec. 29	15.90, Jan. 6;	14.79, Dec. 15	11.33, Jan. 6;	8.50, Dec. 29
1930	2.273c., Jan. 7;	2.018c., Dec. 9	18.21, Jan. 7;	15.90, Dec. 16	15.00, Feb. 18;	11.25, Dec. 9
1929	2.317c., April 2;	2.273c., Oct. 29	18.71, May 14;	18.21, Dec. 17	17.58, Jan. 29;	14.08, Dec. 3
1928	2.286c., Dec. 11;	2.217c., July 17	18.59, Nov. 27;	17.04, July 24	16.50, Dec. 31;	13.08, July 2
1927	2.402c., Jan. 4;	2.212c., Nov. 1	19.71, Jan. 4;	17.54, Nov. 1	15.25, Jan. 11;	13.08, Nov. 22

Demand Fails to Expand In Pittsburgh District



Local Rate Unchanged at 18 Per Cent, But Output Rises in Valleys and in Wheeling District—Scrap Up 25c. a Ton

PITTSBURGH, Nov. 13.—Miscellaneous steel orders have increased very moderately in this district. Automotive tonnage, however, except in the case of steel strip, has yet failed to reflect any expanding tendencies. Placements by the motor car makers with the mills here are still limited to small lots for trial application in new model construction. The improvement in miscellaneous tonnage falls short of providing a boost in ingot output in the Pittsburgh area, which for the fourth consecutive week will average only 18 per cent of capacity.

A more favorable trend is in progress in the Wheeling district, where operations this week are five points higher at 41 per cent. Valley producers are also faring better, with production four points higher at 30 per cent.

The way for broader consumer buying may be cleared next week when filings of first quarter prices will begin. It is safe to say that many steel consumers have been reluctant to place orders until the trend of steel prices, which became uncertain at the close of second quarter, follows a more definite course. The filing of first quarter prices, beginning Nov. 20, will settle this point. So far as can be determined, there will be few, if any, drastic revisions in steel quotations for the coming period. Although, on the one hand, consumers had expected to wait out producers in the hope for lower prices, on the other hand producers are more keenly aware of the economic necessity for maintaining the price structure in the face of low business volume and high producing cost.

No. 1 heavy melting steel at Pittsburgh is 25c. a ton higher.

Pig Iron

With current base prices on pig iron in this district and in the Valleys not expected to be revised for first quarter, consumers find little incentive to specify more freely for shipments in the present quarter. Although general demand is considered slightly heavier than it was a fortnight ago, aggregate volume falls far short of building up furnace backlogs. A primary barrier to heavier pig iron buying has, of course, been the low value of cast scrap, and before virgin metal regains its normal proportion in cupola charges, the present spread between pig iron and cast scrap prices will have to narrow considerably.

Semi-Finished Steel

Skelp is moving actively to non-integrated tube mills. Deliveries to sheet and strip mills are gaining headway, while demand for forging billets is growing. Sheet bars for tin plate conversion are moving more slowly. The reductions in prices in spring wire, spoke wire and basic wire will probably not affect the base quotation on wire rods, since there has never been an established differential between the semi-finished and finished grades.

Rails and Track Accessories

The Norfolk & Western has purchased about 3800 tons of heavy-type tie plates, the order having been distributed among at least four producers. Action on that carrier's inquiry for 10,000 tons of 131-lb. rails is expected this week. The Mesta Machine Co. has purchased two flat cars and two gondola cars from the Standard Steel Car Corpn.

Bars

Demand is holding its own, with daily bookings well diversified. Motor car makers have not yet noticeably expanded their requirements for new model construction, but bar producers believe that heavy automotive tonnage will appear very soon. Small lots of alloy bars, presumably for trial application in new model building, have been sustained.

Reinforcing Steel Bars

The season is opening up for the taking of bids for road construction. While Federal appropriations for such work have been trimmed considerably, the total amount of road work which will be contracted for this year and started next spring will probably not be smaller than usual. A large part of the road work last year was financed entirely by the Federal Government, while this year a good deal of the work will be "Federally aided," i. e., the Government will appropriate funds to be used in connection with State funds, thus maintaining the aggregate normal expenditure for road programs. Bids will be taken this month for the Georgia State penitentiary, requiring 800 tons of billet steel reinforcing. Specifications will soon be out for the parcel post building at Richmond, Va., which will probably require a round lot of reinforcing steel.

Cold-Finished Steel Bars

Aggregate demand has increased, despite the absence of any large lot orders from automotive centers. Consumption by the automobile industry is still restricted to small lots for trial application on new models. Cold-finished bar sellers report a substantially larger amount of "paper" work, indicating an expanding interest among practically all classes of buyers. This interest is expected soon to be translated into actual orders. There is no indication that the present base quotation of 2.10c., Pittsburgh, will be changed for first quarter. Cold-drawn alloy bars also will likely remain unchanged for next quarter.

Plates and Shapes

The barge market continues to be fairly lively. A total of 2460 tons of plates and small shapes will be used in the construction of 13 barges purchased in the past week by the Campbell Transportation Co., Pittsburgh, which has ordered eight coal barges from McClintic-Marshall Corpn., and five covered cargo barges from the Jones & Laughlin Steel Corpn. Structural steel awards expanded moderately. American Bridge Co. as a matter of course will supply the 5500 tons required for constructing the Carnegie Steel Co. mill building at MacDonald, Ohio, which will house a 42-in. strip mill. Fresh structural inquiries are featured by a dam across the Ohio River at Hogsett, W. Va., which will take 3700 tons.

Tubular Products

Standard pipe and oil country goods are relatively the only active classes of tubular goods. The former class is taking its chief stimulus from the HOLC, the normal seasonal repairs to home and industrial heating plants being practically at an end. Construction in certain districts, notably the Southeast, is slightly better and increased movement of standard pipe out of warehouse promises heavier restocking soon. Small diameter tubing, including mechanical tubing and locomotive boiler tubes, is still in very light demand. Pipe mills, on the whole, are averaging about 25 per cent of capacity.

Wire Products

Following a $6 a ton reduction in high-carbon spring wire on Nov. 5, a similar cut has been made effective Nov. 11, on high-carbon basic wire and high-carbon spoke wire. The present quotation on spring wire and spoke wire is 2.90c., Pittsburgh, with basic wire now established at 3.40c., Pittsburgh. At present levels prices are apparently steady. Demand is

barely holding its own and reflects no expanding tendencies. Agricultural wire items are facing a seasonal slump. Jobbers are perhaps increasing their interest, but warehouse buying in the aggregate is disappointing.

Sheets

Miscellaneous orders increased moderately during the past week, while automotive tonnage was definitely limited. The boost in aggregate tonnage, however, was sufficient to enable most mills to increase production, which this week for the sheet industry will average close to 35 per cent. Galvanized sheets are in better demand. So far as can be determined, no radical revisions are expected to be made in present quotations for first quarter.

Tin Plate

Although the leading producer is scheduled for slightly higher production this week, reduced output in other directions will depress the average tin plate output to 35 per cent of capacity. Most consumers are specifying sparingly, and little impetus to the market can be expected until after the 1935 price is announced. Filings of the new price will probably begin next week.

Strip Steel

Motor car and parts makers increased their orders for hot and cold-rolled strip measurably in the past week. Miscellaneous buying also appeared in encouraging volume. As a result of the improvement, rolling schedules at some mills will be well sustained for at least a week or ten days. It is considered doubtful that changes in extras on cold-finished strip steel will be effected for first quarter. No changes in the present base quotations of 1.85c. on hot-rolled strip and 2.60c. on cold-rolled strips, Pittsburgh, will be made for the coming quarter.

Coke and Coal

Wintry weather has stimulated a more active market for heating coke. Foundry coke is moving more rapidly in the local district, while furnace coke continues to drag bottom. Slack and steam-size bituminous coal are still largely neglected. Fuel prices are fairly well maintained, despite the low consumer demand, and may attribute their firm position to minimum price provisions under code authority.

Scrap

No. 1 heavy melting steel in this district has strengthened largely on the strength of dealer bidding to cover outstanding orders. On recent sales to a mill at $10.75 some difficulty is being experienced by brokers in covering at a profit. Small yard dealers are becoming increasingly reluctant to sell No. 1 steel at the present market and trading has reached a veritable stalemate. In view of these circumstances, No. 1 steel is quotable 25c. a ton higher at $10.50 to $11, delivered. A small lot of No. 1 steel has been sold at $11. A large share of the No. 1 steel on the recent Pennsylvania Railroad list is reported to have been sold for delivery in the Wheeling district at $11.20 to $11.40, with a small lot of that grade reported to have gone at $11.75. In the Youngstown district a mill is reported to have purchased a tonnage of No. 1 steel at $11, delivered. Low phosphorus grades are stronger.

Buffalo Production Unchanged

BUFFALO, Nov. 13.—While reports point to better open-hearth operations in district plants in the near future, the number of active furnaces remains the same: six at Bethlehem's Lackawanna plant, three at Republic Steel Corpn., and one at Wickwire-Spencer Corpn. The Seneca sheet division of Bethlehem is running at 15 per cent of capacity.

The largest structural job in some time was awarded last week, when 1270 tons of steel for the Kensington high school went to a Buffalo fabricator.

No scrap tonnages are reported sold, though it is believed that one of the largest consumers or possibly two of them will come into the market soon. The reason for this is that while operations have been light, stockpiles have not been built up as heavily as in some other years. With any kind of increased operation, the mills will buy, dealers believe.

Pig iron is quiet except for the usual volume of small-lot business. The melt shows the same trend as it has for some weeks, with the radiator and boiler interests busiest. The second stack at Bethlehem's Lackawanna plant is still in blast, but it is probable that the original furnace will be taken out soon.

Demand for Sheets Steady at Cincinnati

CINCINNATI, Nov. 13.—Well sustained demand for finished sheets is holding mill production at about 40 per cent of capacity. Automotive specifications are steady, with prospects of further improvement. Domestic appliance manufacturers are regularly in the market for spot needs, while miscellaneous ordering reflects better business sentiment. The leading district interest is operating in all units with staggered averages between Ashland and Middletown. Last week the Ashland rate exceeded that at Middletown, but rolling schedules indicate increased production at the southern Ohio unit this week.

With books for first quarter still unopened, demand for pig iron is not active. Tool and die foundries and stove melters are reporting moderately better business. Prices are holding firm.

Shipments of by-product foundry coke are holding to the October level. Users continue to order on 30-day contracts. Cooler weather is stimulating activity in domestic grades.

The scrap market is in an expectant mood. Mill supplies are not heavy and an improvement in steel output will stimulate buying of old materials. Prices are nominal. Yard interests, while in possession of substantial quantities of scrap, are not prone to sell at current quotations.

Exports Dominate Boston Scrap Mart

BOSTON, Nov. 13.—Prices offered by local brokers for steel turnings and bundled skeleton for Pittsburgh delivery have been advanced 25c. a ton. The higher prices so far have failed to bring out offerings, the only available supply being an occasional tonnage from some one in urgent need of cash. Prices for scrap in general for Pennsylvania delivery are still far out of line with the export market and, until they equalize, domestic steel mills will not be a factor here. The current rate of exports is far is excess of accumulations; consequently scrap supplies are gradually diminishing. No steamers left here with scrap last week, but at least two probably will sail this week, one for Poland and the other for Scotland.

Pig iron sales last week were again small. However, one foundry says it will be in the market next month for 500 tons of No. 2X and No. 1X for first quarter delivery, another foundry intimates it will buy a round tonnage, and several smaller firms say they will need iron for first quarter. Some foundries are melting more iron, others less, but on the whole the outlook is brighter. One of the best step-ups last week was by a foundry heretofore operating two days a week. It is now on a six-day per week basis and is to pour every day.

The Philadelphia Steel Club has elected the following officers: president, A. L. Myers, Alan Wood Steel Co.; vice-president, L. L. Caskey, assistant Philadelphia district manager, Republic Steel Corpn.; secretary and treasurer, F. L. Shantz, Philadelphia district manager, Lukens Steel Co.; directors, A. L. Buterbaugh and W. W. Diehl, of Sharon Steel Hoop Co. and American Steel & Wire Co. respectively.

Chicago Rate in Further Rise to 31 Per Cent

Gain Is Due Mainly To Heavier Demands From Farm Implement Industry—Scrap Moves to Japan—Rail Order Tentatively Placed

CHICAGO, Nov. 13.—Demand for finished iron and steel continues to show moderate improvement as evidenced by ingot output, which has gained one full point to 31 per cent of capacity. This change is due almost wholly to a more substantial demand from manufacturers of farm equipment, who as each week passes put a higher appraisal on the prospects in their market. It now seems to be more than a hope that automobile plants will be the direct cause of a further gain in steel shipments before the month is out.

Bolt prices are showing wide variation on the weak side. Otherwise the market is steady, though sellers are approaching price filing with some degree of concern notwithstanding that most of them insist they have no intention of changing first quarter quotations from current levels.

The Northern Pacific has tentatively closed for 10,000 tons of rails and the Santa Fe is expected to enter the market with at least a first estimate of early requirements for next year. Air conditioning programs by railroads continue to expand and one Western railroad has announced that it will so equip 200 cars. There is more work in prospect for fabricating shops, which are breathing easier following the strike settlement in Milwaukee where plants remain on an open-shop basis and the union is recognized only as a bargaining agent for its own members.

The undercurrent in the scrap market is stronger, though surface signs of price advances have still to make their appearance. A cargo of railroad scrap is moving from a Chicago dock for shipment to Japan.

Pig Iron

The upward trend of the melt is still in evidence, but the climb is slow. A bright spot appears in western Michigan, where a number of automobile foundries are scheduled to take on heavier programs this week. Prices are steady for all grades.

Cast Iron Pipe

Activity is at low ebb and sellers feel that seasonal influences will hold the market in check. The only fresh inquiry of note is from Madison, Wis., which will purchase 375 tons of pipe and fittings. Watertown, Wis., has placed an order for 5200 ft. of 6-in. pipe and Benld, Ill., has purchased 1000 tons.

Reinforcing Bars

New inquiries and various prospective projects give a brighter aspect to this market, though dealers point out that most of the work will be financed with public funds. Opinions as to the election lean decidedly toward the view that private projects will for the most part remain in hiding, at least until the temper of the next Congress is tested. The Sanitary District, Chicago, has an extensive 8-month program. It is planned to award sewer sections at the rate of one a month. All eyes remain turned on the Fort Peck, Mont., project, which calls for 18,000 tons, and the Milwaukee filter plant, which will take 4000 tons. Bids on both jobs will be opened next week.

Wire Products

Output remains in the range from 25 to 30 per cent of capacity. On the whole, business is no better than at the turn of the month, but sellers are in a far better frame of mind and expect good things of the spring trade which should start to open in about 60 days. Users are as interested as ever in prices and they freely voice their opinions against the extra structure, which they insist is too high. Producers are mindful of this attitude and adjustments of one kind or another are in order. Stocks in consumers' hands are still troublesome. A good example of this is afforded by tire makers, who, though reasonably busy, are still taking most of their wire requirements from their own stocks.

Cold-Rolled Strips

Use of this commodity remains in restricted volume, but a turn is expected when automobile manufacturers reach the stage in new model production when they must give attention to trim. It is believed that stocks held at automobile plants are negligible. Competition between sheets and strips is less acute. The feeling is spreading that tonnage business will reclassify these commodities into their rightful fields.

Bolts

This market is characterized by a fair volume of business and uncertain prices. Although low quotations apply principally to the smaller sizes, there also are irregularities throughout most of the standard sizes. Bolts are moving in larger volume from warehouses.

Rails

The Northern Pacific has closed all details except several of minor importance, for the purchase of 10,000 tons of rails, which will be rolled by three producers. The Santa Fe is making progress on its preliminary estimates, which call for 160 miles, or approximately 25,000 tons of rails.

Sheets

New orders, except from automobile manufacturing sources, remain light and the outlook is unsatisfactory for the reason that most users are still able to draw most of their needs from stocks. Consumers are still grumbling because they did not realize expected savings on the sheets that they stocked.

Bars

This market is moving sideways and is without feature. No losses in consumption are to be found among consuming industries and there is a strong possibility that automobile plants will step in for heavier tonnages before the end of the month. The outlook for agricultural machinery improves as each week passes.

Plates

Fabricators must turn to Government-financed jobs when they look for projects that call for real tonnages. The Bureau of Reclamation will take bids on 5000 tons for syphons to be used in the State of Washington. A dam face at Colorado Springs, Colo., will take over 600 tons, mostly in the form of plates. A number of dams on the Ohio River will take 2000 tons of plates and structural shapes.

Structural Material

Chicago fabricators, in attempting to look into the future, estimate that not less than 35,000 tons of structural business is in prospect. Awards are in better volume, the total being 4500 tons. Fresh inquiries, at over 12,000 tons, include 5000 tons for syphons and 4000 tons for dams.

Scrap

Dealers are flocking to the speculative side of the market and are freely taking all offerings. One mill is releasing against orders placed last spring and distress tonnage is not a factor with which dealers must contend. Mills will take only small lots for which they have not paid more than $9 a ton delivered. Miscellaneous grades are moving to a broader field of use. Two boat loads of borings have left Chicago and a cargo of busheling is being loaded this week.

Activity at Philadelphia Declines To 23 Per Cent

Steel Fraternity Discouraged by Poor Outlook—Sheets More Active as 1935 Auto Production Gains Momentum—Scrap Firmness More Apparent

PHILADELPHIA, Nov. 13.—The steel trade in this area is not so much concerned with the present protracted period of consumer indifference as with the poor outlook for the coming quarter. Sheet users are taking some tonnage, mostly against automobile orders, but all other forms of steel are moving very slowly as users adhere to a policy of purchasing only from day to day.

This district expects to share in some of the Navy tonnages on which bids are being taken or have already been opened, and 1000 to 1500 tons will be required by builders of 57 Pennsylvania Railroad electric locomotives placed recently. However, these requirements will be spread so thinly over the next few months that they will give no noticeable lift to mill operations. Pennsylvania and New Jersey have definite road programs, but delay and political manipulations are keeping steel awards at a minimum.

The melting schedules of small mills in this district are practically unaltered from a week ago, but the leading interest has curtailed production. Consequently aggregate activity has been reduced one point to 23 per cent of potential capacity. At Pencoyd a small shape mill is still rolling on a reduced schedule, and other small units in this area are securing enough orders for prompt shipment to take care of their reduced output. No excessive stocking of semi-finished steel is in evidence.

Scrap is developing additional firmness. Many mills drawing their supplies from this area are apparently eating into their reserves, and brokers are of the opinion that buying of some sort must necessarily develop before the year's end. Any appreciable domestic demand would likely boost prices rapidly, and there is some doubt as to whether brokers could deliver a large commitment as easily as they might have a year ago.

Pig Iron

This commodity continues in light demand with no indication that bookings will expand materially over the next two months. Shipments generally are keeping up to schedule, and most foundries are still sufficiently well stocked to avoid the necessity of coming into the market for any iron other than fill-in and specialty grades. Furnace representatives expect prices to be reaffirmed for first quarter as they are convinced that a reduction would drive in no new business. Even some foundries are in favor of price maintenance as a reduction in iron prices would be followed by demands from their customers for excessive cuts on castings.

Imports

The following iron and steel imports were received here last week: 1539 tons of pig iron from the Netherlands, 501 tons of chrome ore from Greece, and 12 tons of steel bands and 11 tons of steel bars from Belgium.

Sheets

Auto stamping plants in this area are increasingly active. About 2500 tons of sheets have already been purchased and indications point toward a steady flow of tonnage over the next two months. Demand from this outlet will probably be even more prominent in the first quarter if calls for new automobile models fulfill the expectations of Detroit producers. The Budd plant is now shipping about 1000 Ford commercial units, 450 new Studebaker bodies for all models and approximately 200 Plymouth units a week. Heintz is more active with auto bodies as well as radio frames. At least 800 tons of sheets will probably be required for the building of the Pennsylvania Railroad's 57 electric locomotives at Altoona and Erie, Pa. Demand from stove makers has fallen to a comparatively low point.

Warehouse Business

November business to date is slightly under that for the similar period in October. No particular type of steel is in demand and no industry is drawing other than small routine requirements. All prices are unchanged.

Bars, Plates and Shapes

No disposition of the tenders to the Navy on Nov. 2 has yet been reported. Additional bids are due Nov. 16 and 20 on 3600 tons of steel to be used for three submarines, eight destroyers and three cruisers. The Pennsylvania Railroad has ordered 57 electric locomotives, and much of the work will be done at Altoona and Erie, Pa. A good proportion of the cast steel chassis will be made at Eddystone, Pa. Although the steel industry will not benefit greatly by this business, it is estimated that total bar, plate and shape requirements will exceed 1500 tons. Structural awards which should come to a head in the next fortnight are the prison buildings at Bordentown, N. J., requiring 620 tons, and new buildings at the Philadelphia Navy Yard requiring 900 tons or more. Bars are practically inactive with little consumer buying and only a slight demand from distributers.

Scrap

The flow of scrap is tightening up somewhat. This condition, together with the possibility of mills entering the market in the next month, is being reflected in sentiment for higher prices. The firm tone in the Pittsburgh market is also a strengthening factor. Several observers maintain that present conditions warrant higher prices, but until actual sales are made the market remains untested. On the other side of the picture is the ability of Bethlehem to secure moderate quantities of steel under export prices by purchasing direct. The same company recently bought 3000 tons of light clippings, etc., at $6.50, delivered Sparrows Point, Md. Exporters here are as busy as ever. Two fresh boats are loading steel at Port Richmond for Japan, and accumulations of stove plate will soon be loaded for England. Brokers are securing these grades at prices unchanged from previous weeks.

Eastman Addresses Traffic League Meet

THE National Industrial Traffic League, 1 La Salle Street, Chicago, will hold its annual meeting, Nov. 14 and 15, in New York. The annual luncheon on the first day was scheduled to be addressed by Joseph B. Eastman, Federal coordinator of transportation. Among other speakers were to be J. J. Pelley, former president of the New York, New Haven & Hartford, and newly elected president of the reorganized association of American railroads.

Included among subjects to be discussed are inland waterways, highways, and legislative tendencies. The legislative committee is recommending opposition to a six-hr. day for railroad labor and is opposed also to the unification of Governmental transportation matters under a cabinet member.

Production Off Seven Points In Cleveland-Lorain Area

Present Rate Is 32 Per Cent—Gain in Automotive Tonnage Is Slow in Materializing—Steel Scrap Advances

CLEVELAND, Nov. 13.—The automotive industry continues to place some orders in moderate-sized lots for sheets and strip steel and in a more limited way for bars. However, demand from this field has not increased this month as rapidly as had been expected and there are indications now that with delays in getting under production on new models a heavy volume of business from the automotive field will not materialize until some time in December. Stamping plants are placing some business for material for automobile parts. These also are figuring on automobile parts for delivery during the first half of next year and are seeking information about first quarter prices on sheets and strip steel. Considerable business is expected from parts makers when books for the first quarter are opened Dec. 1.

With consumer stocks getting low, miscellaneous demand for sheets is tending upward. Metal-working industries outside of those catering to the automotive field are with few exceptions showing little, if any, increase in activity and the demand for the heavier rolled steel products shows virtually no increase over October.

Ingot output in the Cleveland-Lorain territory dropped back seven points to 32 per cent of capacity this week. Operations in Lorain were reduced from eight to four open-hearths but a Bessemer converter was put on. In Cleveland one additional open-hearth was started up.

Little new inquiry is coming out in the structural field in which activity is largely confined to public work. Railroad purchases are very small. The purchase of a round tonnage of scrap by a Youngstown district consumer has caused a firming of prices and a local advance of 50c. a ton on steel-making grades.

Pig Iron

Sales and shipments are holding to recent volume although no orders for round lots were placed during the week. Business this month is expected to slightly exceed that taken in October. Consumers in many cases are deferring purchases until they need the iron and then ask for quick deliveries. Demand from the motor car industry so far has improved only moderately, but a further gain is expected shortly.

Iron Ore

With only a few cargoes remaining to be moved the ore shipping season is expected to close this week. Some of the shipping docks already have wound up for the season. Receipts at Lake Erie ports during October were 1,761,215 tons and for the season to Nov. 1 were 15,143,854 tons as against 15,380,486 tons during the corresponding period last year. Other ports made a better comparative showing than Lake Erie ports in receipts this season, these points, mostly Lake Michigan ports, having received 6,073,981 tons this season as compared with 4,692,077 tons during the same period last year. Shipments from Lake Erie ports during October were 1,103,091 tons and for the season to Nov. 1 were 10,797,599 tons as against 11,445,387 tons during the same period last year. The dock balance Nov. 1 was 5,284,816 tons, as compared with 5,335,885 tons on the same date a year ago.

Bars, Plates and Shapes

The recent moderate improvement in steel bar orders which is resulting from a more active demand from the automotive industry is being maintained. Business from other sources is light. Interest in the construction field is centered on the Lorain Avenue bridge, Cleveland, requiring 3050 tons of shapes, for which the State Highway Department will take bids Nov. 16. The only sizable new inquiry is from the Chesapeake & Ohio Railroad for a bridge at Newport News, Va., taking 300 tons of shapes. The plate market is dull.

Sheets

Some additional business has come from the automotive industry but only in small lots. Substantial orders are looked for from this source this week, although automobile companies may defer heavy purchases until December or for delivery in time for January production. Activity in the local Fisher Body plant is very limited. Some stamping plants have been asked to quote prices for automobile parts for the first half of 1935 delivery and have asked for steel prices, but producers under the code cannot take orders for next year's delivery until Dec. 1 and then only for the first quarter. Demand from miscellaneous consumers who have about used up their stocks has improved moderately. Refrigerator manufacturers are getting under production on new models and are ordering some sheets.

Strip Steel

The market is dragging. While some business continues to come from the automotive field, orders are confined to small lots. Hot-rolled strip is moving slightly better than recently to cold strip mills that buy their hot-rolled material. Miscellaneous demand is light.

Bolts and Nuts

Demand from the automotive industry is tending upward, some fair-sized orders being placed during the week by General Motors units and the Ford Motor Co. While shading has not been entirely eliminated, prices are being well maintained at the regular 70, 10, 10 and 10 discount.

Scrap

A Youngstown district mill has purchased a round tonnage of steel-making scrap at reported prices of $11 for No. 1 and $10.25 for No. 2, and dealers are covering against their new orders, offering $10.50 and $9.75 for these grades respectively or 25 to 50c. a ton more than they have been paying recently. While present freight rates prevent much Cleveland scrap from moving to the Youngstown district, the Youngstown purchase has caused a stiffening of the local market with advances of 50c. a ton in quotations on steel-making grades. However, in the absence of a local demand these prices are nominal.

Detroit Scrap Lethargic

DETROIT, Nov. 13.—The local scrap market is in a lethargic state pending expansion of steel operations. Consumers have comfortable stocks on hand and dealers are inclined to hold tonnages in their yards in anticipation of higher prices within a short time. Blast furnace scrap is said to be moving out of Detroit by water to Buffalo. Substantial tonnages due on current contracts are yet to be transported to Lake Erie ports, particularly Buffalo, before the navigation season closes. Prices are strong at the levels prevailing a week ago.

Modern Machine Works, Inc., Milwaukee, maker of motor transmission and crankshafts, has removed to larger quarters at Cudahy, Wis.

Heavy Materials More Active at New York

Structural Projects and Railroad Equipment Purchases Will Yield Mills Considerable Tonnage—Exports to Cuba Improve

NEW YORK, Nov. 13.—Prospective awards of heavy rolled products for specific construction and railroad projects hold the center of the stage in this district. James Stewart & Co., Inc., are low general contract bidders on most of the alternates for the new local Federal building, which will require a maximum of 28,000 tons of steel. The steel for the Tygart River dam, Grafton, W. Va., totaling 3400 tons, will probably be placed by Frederick Snare Corpn., New York, during the current week. The requirements of the New York approach to the Midtown Hudson River tunnel are estimated at 2200 tons of structural steel, 1400 tons of concrete bars, and 2150 tons of cast iron lining with an alternate of 850 tons of structural steel lining. Bids, however, will probably not be asked for before Jan. 1. Private construction work is still limited, although a revival in apartment house building is apparently getting under way. Thus far the steel requirements per project have ranged from 75 to 150 tons and in most cases second-hand material has been bought.

The Pennsylvania Railroad has divided orders for 57 electric locomotives among three builders. The Lehigh Valley is expected to award 250 50-ft. gondola cars this week.

Steel demand in general has shown little, if any, gain in this district. Pipe jobbers are buying somewhat more freely, although some of them still have large stocks. The inventories of some of the large tin plate consumers are also said to be rather heavy. Demand for nails and wire from Cuba has expanded materially since the conclusion of the reciprocal trade agreement with that country.

Pig Iron

This market continues to be in a semi-static condition. Foundry operations are not very encouraging and consequently pig iron purchases are being made only against day-to-day requirements. Approximately 1000 tons of new bookings were known to have been made last week, as compared with 1200 tons in the previous period and 1400 tons sold two weeks earlier. What few contracts are outstanding are being liquidated in good order. First quarter prices will probably not be announced before Dec. 1. All sellers expect present quotations to be reaffirmed.

Reinforcing Steel

Distributers are taking care of a moderate number of small orders but business of any tonnage is currently quite scarce. Only a few highway awards are coming out, and there is not very much to look forward to at the present time. New York State is opening bids on Nov. 13 and 20 for projects requiring about 500 tons of mesh. The American Steel & Wire Co. will furnish 150 tons of mesh for a highway in Columbia County, N. Y., and Truscon Steel Co. was awarded 520 tons of bars for a bridge at Covington, Ky.

Scrap

With steel operations in eastern Pennsylvania hardly holding at 24 per cent, domestic scrap demand will likely continue to be a negligible factor for some months. Buying for export, however, is still undiminished in volume. On large lots brokers are willing to pay premiums, but the regular truck trade continues to deliver No. 1 and No. 2 heavy melting steel at $8 and $6.50 a ton respectively. Four boats are now loading in this area, mostly for the Orient although one ship is for Italian users. In addition barge accumulations of cast iron and stove plate are being made for England. Of considerable interest, but probably of no great importance, is the attested rumor that over 2000 tons of steel has been sold at Chicago for Japanese delivery. Movement may probably be by Lake boat to the Coast for trans-shipment.

Structural Market Active on Coast

SAN FRANCISCO, Nov. 12.—Marked improvement in structural steel activity on the Coast is evidenced by bookings for 4106 tons during the past two weeks. The awards were not only greater in number but their total volume exceeded that of any corresponding period since the placement of tonnages in August for work at Bonneville dam. Pacific Car & Foundry Co. took 1400 tons for the Columbia River highway and 200 tons for a conveyor system, both at Grand Coulee dam.

New projects involving structural steel have likewise increased. Oakland, Cal., will take bids Dec. 12 for a 12-story county court house, estimated to cost $2,000,000. Preliminary plans called for approximately 2000 tons of structural steel. At Pearl Harbor, T. H., a naval airplane hangar calls for 800 tons, while a city prison will require 200 tons. Projects involving 19,142 tons of structural steel are pending on the Coast. A formal award is expected shortly at San Francisco for 2600 tons included under contract No. 5 on the Golden Gate bridge. Columbia Steel Co. was low bidder on the steel.

With few exceptions the reinforcing bar and cast iron pipe markets have been quiet. United States Pipe & Foundry Co. took 7460 tons of cast iron pipe for high-pressure lines at San Francisco and 950 tons at Brawley, Cal. Plate bookings have been few but for larger tonnages. Western Pipe & Steel Co. has been recommended for the award of 4100 tons of plates and 170 tons of structural steel for siphons for the Colorado River aqueduct. The report that the Standard Oil Co. has placed 600 tons of plates for tank covers has not been confirmed.

Production Unchanged In South

BIRMINGHAM, Nov. 13. — The irregular, sluggish trend of the pig iron market still persists. Foundries are interested only in immediate requirements and their purchases are not large. The blast furnaces are depending mostly on day-to-day orders, which are either for spot deliveries or cover a few weeks.

For a month there have been four furnaces in blast, three being on foundry iron and one on basic. The price remains at $14.50.

Sheet and wire products have only a fair demand and constitute about the only activity in the steel market. Bar, plate and shape tonnage of any size is spasmodic.

Six open-hearths operated last week and no change will be made during the current week.

Fabricated Structural Steel

Awards Higher—New Projects in Better Volume

LETTINGS of 12,850 tons are swelled by 5500 tons for a strip mill at Youngstown, Ohio, for the Carnegie Steel Co. The only other sizable award is 1645 tons for bridges in Iowa. New projects of 13,325 tons compare with 7000 tons last week and 14,650 tons two weeks ago. Among new inquiries is 3700 tons for a dam in the Ohio River at Hogsett, W. Va., 2000 tons for a County court house at Oakland, Cal., and 1250 tons for a parcel post building at Richmond, Va. Plate awards, at 3500 tons, include 2460 tons for 13 barges for the Campbell Transportation Co., Pittsburgh. Structural steel awards for the week follow:

NORTH ATLANTIC STATES

Waltham, Mass., 105 tons, city bridge, to New England Structural Co.

Boston, 300 tons, repairs to Northern Avenue bridge, to Lehigh Structural Steel Co.

New York, 140 tons, viaduct floor framing at 158th Street, to McClintic-Marshall Corpn.

Smithtown, N. Y., 140 tons, State highway bridge, to McClintic-Marshall Corpn.

Washington, 415 tons, bus garage, to Lehigh Structural Steel Co.

THE SOUTH

Covington, Ky., 800 tons, highway bridge, to R. C. Mahon.

CENTRAL STATES

Youngstown, Ohio, 5500 tons, strip mill building for Carnegie Steel Co., to American Bridge Co.

Chicago, 250 tons, school, to Wendgagel & Co.

Chicago, 640 tons, subway at Ninety-fifth Street, to Hansell-Elcock Foundry Co.

State of Iowa, 1645 tons, bridges, 1270 tons to McClintic-Marshall Corpn., and 375 tons to Pittsburgh-Des Moines Steel Co.

DeSoto, Wis., 150 tons, bridge, to Fort Pitt Bridge Works Co.

Danville, Wis., 150 tons, bridge, to Worden Allen Co.

Belle Plaine, Minn., 125 tons, State highway bridge, to American Bridge Co.

Livingston County, Mo., 110 tons, bridge, to St. Louis Structural Steel Co.

Bates County, Mo., 470 tons, bridges, to Missouri Valley Bridge & Iron Co.

State of Missouri, 690 tons, bridges; 340 tons to McClintic-Marshall Corpn., and 350 tons to St. Louis Structural Steel Co.

State of Nebraska, 320 tons, highway bridges, to St. Joseph Structural Steel Co.

THE WEST

Valley County, Mont., 133 tons, State bridge over Milk River, to an unnamed bidder.

Fremont County, Colo., 105 tons, State highway structure, to an unnamed bidder.

Boulder City, Nev., 320 tons, crane rails for Boulder Dam, to Stupp Brothers Bridge & Iron Co.

Bakersfield, Cal., 110 tons, Union Avenue underpass, to Judson-Pacific Co.

Seattle, 215 tons angle steel, for city, to Pacific Coast Steel Co.

Los Angeles, 170 tons, siphon supports on Colorado River aqueduct, Schedule 18S under Specification No. 75, award recommended to Western Pipe & Steel Co.

NEW STRUCTURAL STEEL PROJECTS

NORTH ATLANTIC STATES

Pennsylvania Railroad, 200 tons, transfer bridge at New York.

State of New York, 670 tons, highway bridges.

Buffalo, 650 tons, police station; Charles H. Everett, low bidder.

Washington, 500 tons, lookout towers for Department of Agriculture.

THE SOUTH

Chesapeake & Ohio Railroad, 350 tons, Twenty-fifth Street bridge at Newport News, Va.

Richmond, Va., 1250 tons, parcel post building.

Hogsett, W. Va., 3700 tons, dam across Ohio River.

Belton, Tex., 225 tons, bridge.

CENTRAL STATES

Youngstown, Ohio, 275 tons, cranes.

Springfield, Ill., 800 tons, filter plant.

State of Illinois, 165 tons, bridge; bids Nov. 16.

State of Indiana, 500 tons, bridges.

State of Wisconsin, 125 tons, two bridges; bids Nov. 20.

State of Wisconsin, 420 tons, two bridges; bids Nov. 27.

Alma, Wis., 275 tons, State highway bridge; bids Nov. 27.

Clintonville, Wis., 150 tons, State highway bridge; bids Nov. 27.

Winona, Minn, 2000 tons, dam across Mississippi River; bids Dec. 12.

WESTERN STATES

El Paso County, Colo., 550 tons, State highway bridge; bids soon.

Oakland, Cal., 2000 tons, county court house; bids Dec. 12.

Long Beach, Cal., 165 tons, arts and science building at Jefferson High School; bids soon.

Pearl Harbor, T. H., 800 tons, hangar at Naval Air Base, Specification 7770; bids Nov. 14.

Honolulu, T. H., 200 tons, Oahu prison; bids Nov. 14.

FABRICATED PLATE

AWARDS

East Providence, R. I., 195 tons, two tanks, for Standard Oil Co. of New Jersey, to unnamed fabricator.

New Brunswick, N. J., 230 tons, pipe for filtration plant, to Alco Products, Inc.

Wheeler Dam, Tenn., 575 tons, turbine inlets for TVA authority, to Virginia Bridge & Iron Co., Inc.

Langley Field, Va., 130 tons, wind tunnel, to Chicago Bridge & Iron Works.

Pittsburgh, 2460 tons, 13 barges for Campbell Transportation Co.; eight coal barges, 1340 tons, to McClintic-Marshall Corpn.; five covered cargo barges, 1120 tons, to Jones & Laughlin Steel Corpn.

Shawano, Wis., 250,000-gal. steel tank on 130-ft. steel tower, to Pittsburgh-Des Moines Steel Co.

Los Angeles, 100 tons, material for Metropolitan Water District, to Consolidated Steel Corpn.

Los Angeles, 4100 tons, siphons on Colorado River aqueduct, Schedule 18S under Specification No. 75; award recommended to Western Pipe & Steel Co.

Pig Iron Demand Improves at St. Louis

ST. LOUIS, Nov. 13.—As an aftermath of the election there has been a spurt of inquiries for pig iron, evidently prompted by the belief that inflation was rendered more certain by the success of the party in power. There also has been considerable spot business, and shipments for November so far are said to be about double what they were at this time last month. The melt in this territory is improving in all lines, with the exception of the steel plants. The stove plants are still going strong. The implement business has shown some improvement, although it has not been fully up to expectations.

An East Side mill bought between 3000 and 4000 tons of heavy melting steel scrap at the present market, for delivery over the next 60 days. Other mills have not signified their intention of coming into the market soon, and yet dealers are optimistic because of higher prices prevailing in other consuming centers. Dealers' opinions of a better market are strengthened by the movement of scrap for export. Prices are nominally unchanged.

The East St. Louis (Ill.) Levee & Sanitary Board has accepted the bid of G. Locke Tarlton of $2,259,993 for the diversion of Cohokia Creek, for which the PWA has extended a loan and grant of $2,360,000 and which will require 1200 tons of reinforcing bars. Otherwise the finished iron and steel trade is quiet. Warehouse trade is reported to be better than at this time last month.

A new publication, "Practical Everyday Chemistry," is a non-theoretical treatise containing hundreds of practical modern working formulae for the making of all kinds of products. The editor is H. Bennett of the Chemical Formulary, and the publisher is the Chemical Publishing Co., New York. The various products are simply described and the weights of constituents are given. Among the articles in the book are various kinds of adhesives, beverages, cements, colors, cosmetics, drugs, inks, leathers, metals, oils, polishes, and many other products which are daily encountered in the factory, home or office. Various methods of rust-proofing are described, as well as lubricants, cutting oils, metal coloring solutions, enameling procedures, and a miscellaneous number of tables and conversion charts.

Prices of Finished Steel and Iron Products

BARS, PLATES, SHAPES

Iron and Steel Bars

Soft Steel — *Base per Lb.*

F.o.b. Pittsburgh	1.80c.
F.o.b. Chicago	1.85c.
F.o.b. Gary	1.85c.
F.o.b. Duluth	1.95c.
Del'd Detroit	1.95c.
F.o.b. Cleveland	1.85c.
F.o.b. Buffalo	1.90c.
Del'd Philadelphia	2.09c.
Del'd New York	2.13c.
F.o.b. Birmingham	1.95c.
F.o.b. cars dock Gulf ports	2.20c.
F.o.b. cars dock Pacific ports	2.35c.

Rail Steel

(For merchant trade)

F.o.b. Pittsburgh	1.70c.
F.o.b. Chicago	1.75c.
F.o.b. Gary	1.75c.
F.o.b. Moline, Ill.	1.75c.
F.o.b. Cleveland	1.75c.
F.o.b. Buffalo	1.80c.
F.o.b. Birmingham	1.85c.
F.o.b. cars dock Gulf ports	2.10c.
F.o.b. cars dock Pacific ports	2.25c.

Billet Steel Reinforcing

(Straight lengths as quoted by distributers)

F.o.b. Pittsburgh	2.05c.
F.o.b. Chicago	2.10c.
F.o.b. Gary	2.10c.
Del'd Detroit	2.20c.
F.o.b. Cleveland	2.10c.
F.o.b. Youngstown	2.10c.
F.o.b. Buffalo	2.10c.
F.o.b. Birmingham	2.10c.
F.o.b. cars dock Gulf ports	2.45c.
F.o.b. cars dock Pacific ports	2.45c.

Rail Steel Reinforcing

(Straight lengths as quoted by distributers)

F.o.b. Pittsburgh	1.90c.
F.o.b. Chicago	1.95c.
F.o.b. Gary	1.95c.
F.o.b. Cleveland	1.95c.
F.o.b. Youngstown	1.95c.
F.o.b. Buffalo	1.95c.
F.o.b. Birmingham	1.95c.
F.o.b. cars dock Gulf ports	2.30c.
F.o.b. cars dock Pacific ports	2.30c.

Iron

F.o.b. Chicago	1.80c.
F.o.b. Terre Haute, Ind.	1.75c.
F.o.b. Louisville, Ky.	2.10c.
F.o.b. Danville, Pa.	1.80c.
F.o.b. Berwick, Pa.	1.80c.

Cold Finished Bars and Shafting*

Base per Lb.

F.o.b. Pittsburgh	2.10c.
F.o.b. Chicago	2.15c.
F.o.b. Gary	2.15c.
F.o.b. Cleveland	2.15c.
F.o.b. Buffalo	2.20c.
Del'd Detroit	2.30c.
Del'd eastern Michigan	2.35c.

* In quantities of 10,000 to 19,000 lb.

Fence and Sign Posts

Angle Line Posts

Base per Net Ton

F.o.b. Pittsburgh	$50.00
F.o.b. Chicago	50.00
F.o.b. Duluth	51.00
F.o.b. Cleveland	50.00
F.o.b. Birmingham	53.00
F.o.b. Houston	59.00
F.o.b. cars dock Pacific ports	68.00

Plates

Base per Lb.

F.o.b. Pittsburgh	1.80c.
F.o.b. Chicago	1.85c.
F.o.b. Gary	1.85c.
Del'd Cleveland	1.85c.
F.o.b. Coatesville	1.90c.
F.o.b. Sparrows Point	1.90c.
Del'd Philadelphia	1.985c.
Del'd New York	2.08c.
F.o.b. Birmingham	1.95c.
F.o.b. cars dock Gulf ports	2.20c.
F.o.b. cars dock Pacific ports	2.35c.
Wrought iron plates, f.o.b. P'gh	3.20c.

Floor Plates

F.o.b. Pittsburgh	3.35c.
F.o.b. Chicago	3.40c.
F.o.b. Coatesville	3.45c.
F.o.b. cars dock Gulf ports	3.75c.
F.o.b. cars dock Pacific ports	3.90c.

Structural Shapes

Base per Lb.

F.o.b. Pittsburgh	1.80c.
F.o.b. Chicago	1.85c.
Del'd Cleveland	1.985c.
F.o.b. Buffalo	1.90c.
F.o.b. Bethlehem	1.90c.
Del'd Philadelphia	2.005c.
Del'd New York	2.0525c.
F.o.b. Birmingham (standard)	1.95c.
F.o.b. cars dock Gulf ports	2.25c.
F.o.b. cars dock Pacific ports	2.35c.

Steel Sheet Piling

Base per Lb.

F.o.b. Pittsburgh	2.15c.
F.o.b. Chicago	2.25c.
F.o.b. Buffalo	2.25c.
F.o.b. cars dock Gulf ports	2.60c.
F.o.b. cars dock Pacific ports	2.60c.

SHEETS, STRIP, TIN PLATE TERNE PLATE

Sheets

Hot Rolled

Base per Lb.

No. 10, f.o.b. Pittsburgh	1.85c.
No. 10, f.o.b. Gary	1.95c.
No. 10, del'd Detroit	2.05c.
No. 10, del'd Phila.	2.14c.
No. 10, f.o.b. Birmingham	2.00c.
No. 10, f.o.b. dock cars Pacific ports	2.40c.

Hot-Rolled Annealed

No. 24, f.o.b. Pittsburgh	2.40c.
No. 24, f.o.b. Gary	2.50c.
No. 24, del'd Detroit	2.60c.
No. 24, del'd Phila.	2.69c.
No. 24, f.o.b. Birmingham	2.55c.
No. 24, f.o.b. dock cars Pacific ports	3.05c.
No. 24, wrought iron, Pittsburgh	4.30c.

Heavy Cold-Rolled

No. 10 gage, f.o.b. Pittsburgh	2.50c.
No. 10 gage, f.o.b. Gary	2.60c.
No. 10 gage, del'd Detroit	2.70c.
No. 10 gage, del'd Phila.	2.79c.
No. 10 gage, f.o.b. Birmingham	2.55c.
No. 10 gage, f.o.b. dock cars Pacific ports	3.10c.

Light Cold-Rolled

No. 20 gage, f.o.b. Pittsburgh	2.95c.
No. 20 gage, f.o.b. Gary	3.05c.
No. 20 gage, del'd Detroit	3.15c.
No. 20 gage, del'd Phila.	3.24c.
No. 20 gage, f.o.b. Birmingham	3.10c.
No. 20 gage, f.o.b. dock cars Pacific ports	3.50c.

Galvanized Sheets

No. 24, f.o.b. Pittsburgh	3.10c.
No. 24, f.o.b. Gary	3.20c.
No. 24, del'd Phila.	3.39c.
No. 24, f.o.b. Birmingham	3.25c.
No. 24, f.o.b. dock cars Pacific ports	3.70c.
No. 24, wrought iron, Pittsburgh	4.95c.

Long Ternes

No. 24, unassorted 8-lb. coating f.o.b. Pittsburgh	3.40c.
F.o.b. cars dock Pacific ports	4.10c.

Vitreous Enameling Stock

No. 20, f.o.b. Pittsburgh	3.10c.

Tin Mill Black Plate

No. 28, f.o.b. Pittsburgh	2.75c.
No. 28, Gary	2.85c.
No. 28, cars dock, Pacific Coast ports	3.35c.

Tin Plate *Base per Box*

Standard cokes, f.o.b. P'gh district mill	$5.25
Standard cokes, f.o.b. Gary	5.35
Standard cokes, f.o.b. cars dock Pacific ports	5.90

Terne Plate

(F.o.b. Pittsburgh)

(Per Package, 20 x 28 in.)

8-lb. coating I.C.	$10.00
15-lb. coating I.C.	12.00
20-lb. coating I.C.	13.00
25-lb. coating I.C.	14.00
30-lb. coating I.C.	15.25
40-lb. coating I.C.	17.50

Hot-Rolled Hoops, Bands, Strips and Flats under ¼ In.

Base per Lb.

All widths up to 24 in., P'gh	1.85c.
All widths up to 24 in., Chicago	1.95c.
All widths up to 24 in., del'd Detroit	2.05c.
All widths up to 24 in., Birmingham	2.00c.
Cooperage stock, Pittsburgh	2.10c.
Cooperage stock, Chicago	2.20c.

Cold-Rolled Strips

Base per Lb.

F.o.b. Pittsburgh	2.60c.
F.o.b. Cleveland	2.60c.
Del'd Chicago	2.88c.
F.o.b. Worcester	2.80c.

Fender Stock

No. 14, Pittsburgh or Cleveland	2.90c.
No. 14, Worcester	3.30c.
No. 20, Pittsburgh or Cleveland	3.30c.
No. 20, Worcester	3.70c.

Hot-Rolled Rail Steel Strips

Base per Lb.

F.o.b. Pittsburgh	1.70c.
F.o.b. Chicago	1.75c.
F.o.b. Birmingham	1.85c.

WIRE PRODUCTS

(Carload lots, f.o.b. Pittsburgh and Cleveland.)

To Manufacturing Trade — *Per Lb.*

Bright wire	2.30c.
Spring wire	2.90c.

Chicago prices on products sold to the manufacturing trade are $1 a ton above Pittsburgh or Cleveland. Worcester prices are $2 a ton above, and Pacific Coast prices $9 a ton above.

To Jobbing Trade

Qualified jobbers are entitled to a reduction of 20c. a 100 lb. from the base price on carload shipments to stock, and of 10c. a 100 lb. on less-carload shipments to stock.

Base per Keg

Standard wire nails	$2.60
Smooth coated nails	2.60
Galvanized nails:	
15 gage and coarser	4.60
16 gage and finer	5.10

Base per 100 Lb.

Annealed fence wire	$2.45
Galvanized fence wire	2.80
Polished staples	3.30
Galvanized staples	3.55
Barbed wire, galvanized	3.00
Woven wire fence, base column	63.00

Chicago and Anderson, Ind., mill prices are $1 a ton over Pittsburgh base (on all products except woven wire fence, for which the Chicago price is $2 above Pittsburgh); Duluth, Minn., and Worcester, Mass., mill prices are $2 a ton over Pittsburgh (except for woven wire fence at Duluth which is $3 over Pittsburgh), and Birmingham mill prices are $3 a ton over Pittsburgh.

On manufacturers' wire prices at Pacific ports are $9 above the Pittsburgh base. On high-carbon spring wire, prices at Pacific ports are also $9 above Pittsburgh. On wire nails, barbed wire, staples and fence wire, prices at Houston, Galveston and Corpus Christi are $6 a ton over Pittsburgh, while New Orleans and Pacific Coast prices are $8 over Pittsburgh. Exception: on fence wire Pacific Coast prices are $11 a ton above Pittsburgh.

Wire Hoops, Twisted or Welded

Off List

F.o.b. Pittsburgh	35 and 2½ off
F.o.b. Chicago	35 off

Bale Ties, Single Loop

Base per Net Ton

F.o.b. Pittsburgh	$63.00
F.o.b. Chicago	64.00
F.o.b. Duluth	65.00
F.o.b. Cleveland	63.00
F.o.b. Birmingham	66.00
F.o.b. cars dock Houston, Galveston, Beaumont, Orange or Corpus Christi, Tex.	72.00
F.o.b. cars dock Pacific ports	74.00

STEEL AND WROUGHT PIPE AND TUBING

Welded Pipe

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio, Mills

F.o.b. Pittsburgh only on wrought iron pipe.

Butt Weld

Steel Inches	Steel Black	Steel Galv.	Wrought Iron Inches	Wrought Iron Black	Wrought Iron Galv.
⅛	51½	29½	⅛	+91½	+138
¼ to ⅜	53½	35	¼ & ⅜	+11½	+21½
½	58½	47	½	31½	15
⅝	62	52	⅝	36½	20½
1 to 3	64	55	1 & 1¼	39½	25½
			1½	43½	28
			2	41½	26

Lap Weld

2	60	51	2	37	22½
2½ to 3	63	54	2½ to 3½	38	25
3½ to 6	65	56	4 to 8	40	28½
7 and 8	64	54	9 to 12	38	24½
9 and 10	63½	53½			
11 and 12	62½	52½			

Butt Weld, extra strong, plain ends

⅛	48½	33½	⅛	+13	+45½
¼ to ⅜	51	38	¼ & ⅜	+2½	+31½
½	56½	47½	½	32½	17½
¾	61	52	¾	37½	22½
1 to 3	63	55	1 to 2	43½	29

Lap Weld, extra strong, plain ends

2	58	50	2	40	26
2½ to 3	62	54	2½ to 4	45½	33
3½ to 8	65½	57½	4½ to 6	45	33½
7 and 8	64½	54½	7 & 8	46	33
9 and 10	63½	53½	9 to 12	41½	30
11 and 12	62½	52½			

On standard steel pipe an extra 5% off is allowed on sales to consumers while two 5's off apply on sales to jobbers. On less-than-carload shipments prices are determined by adding 20 and 25% and the carload freight rate to the base card. On structural steel pipe the base card is reduced 2 points and two 5's off are allowed to consumers and three 5's off to jobbers.

Note—Chicago district mills have a base two points less than the above discounts. Chicago delivered base is 2½ points less. Freight is figured from Pittsburgh, Lorain, Ohio, and Chicago district mills, the billing being from the point producing the lowest price to destination.

Boiler Tubes

Seamless Steel Commercial Boiler Tubes and Locomotive Tubes

(Net base prices per 100 ft. f.o.b. Pittsburgh, in carload lots)

			Cold Drawn	Hot Rolled
1 in. o.d.	13	B.W.G.	$ 8.60	$7.22
1¼ in. o.d.	13	B.W.G.	10.19	9.36
1½ in. o.d.	13	B.W.G.	11.26	10.32
1¾ in. o.d.	13	B.W.G.	12.81	11.84
2 in. o.d.	13	B.W.G.	14.35	13.04
2¼ in. o.d.	13	B.W.G.	16.00	14.56
2½ in. o.d.	12	B.W.G.	19.29	17.58
2¾ in. o.d.	12	B.W.G.	20.45	18.59
3 in. o.d.	12	B.W.G.	21.45	19.50
3¼ in. o.d.	11	B.W.G.	25.22	22.93
3½ in. o.d.	11	B.W.G.	27.09	24.54
4 in. o.d.	10	B.W.G.	33.60	30.54
4½ in. o.d.	10	B.W.G.	41.08	37.35
5 in. o.d.	9	B.W.G.	51.56	46.87
6 in. o.d.	7	B.W.G.	79.15	71.94

Extras for less-carload quantities:

25,000 lb. or ft. to 39,999 lb. or ft.	5 %
10,000 lb. or ft. to 24,999 lb. or ft.	12½ %
2,000 lb. or ft. to 9,999 lb. or ft.	25 %
Under 2,000 lb. or ft.	40 %

Hot-Finished Lapweld Steel Pressure Tubes

(Net base prices per 100 ft., f.o.b. Pittsburgh, in carload lots)

1½ in. o.d.	13	B.W.G.	$ 9.73
1¾ in. o.d.	13	B.W.G.	11.06
2 in. o.d.	13	B.W.G.	12.33
2¼ in. o.d.	13	B.W.G.	13.79
2½ in. o.d.	12	B.W.G.	16.58
2¾ in. o.d.	12	B.W.G.	17.56
3 in. o.d.	12	B.W.G.	18.32
3¼ in. o.d.	11	B.W.G.	21.58
3½ in. o.d.	11	B.W.G.	23.15
4 in. o.d.	10	B.W.G.	28.60
4½ in. o.d.	10	B.W.G.	35.22
5 in o.d.	9	B.W.G.	44.28
6 in. o.d.	7	B.W.G.	68.14

Quantity Extras:

40,000 lb. or ft.	base
25,000 lb. or ft. to 39,999 lb. or ft.	plus 5 %
10,000 lb. or ft. to 24,999 lb. or ft.	plus 12½ %
2,000 lb. or ft. to 9,999 lb. or ft.	plus 25 %
Under 2,000 lb. or ft.	plus 40 %

CHARCOAL IRON BOILER TUBES

Base Discounts, f.o.b. Pittsburgh

In. O. D.	
1½ and 1¾	44
2—2¼	13 and 10
2½—2¾	16 and 10
3	17 and 10
3¼—3½	18 and 10
4	20 and 10
4½, 5, 6	21 and 10

Extras for quantity: For 1½ to 1¾ up 8 points under 10,000 lb., up 4 points 10,000 lb. to carload. For 2 in. to 3½ in., up 2 points without supplementary 10 per cent, under 10,000 lb.; supplementary 5 per cent instead of supplementary 10 per cent for 10,000 lb. to carload.

In sizes 2 in. to 4½ in. O.D. inclusive, all tubes more than four gages heavier than standard are priced per lb. as follows: Carload and over, 9c.; extras for quantity—under 10,000 lb. 1c. per lb., 10,000 lb. to carload ½c. per lb.

CAST IRON WATER PIPE

Per Net Ton

6-in. and larger, del'd Chicago	$47.00
4-in., del'd Chicago	50.00
6-in. and larger, del'd New York	45.00
4-in. del'd New York	48.00
6-in., and larger, Birmingham	39.00
4-in. Birmingham	42.00

Class "A" and gas pipe, $3 extra

RAILROAD MATERIALS

Rails and Track Supplies

F.o.b. Mill

Standard rails, heavier than 60 lb., per gross ton	$36.37½
Angle bars, per 100 lb.	2.55

F.o.b. Code Basing Points

Light rails (from billets) per gross ton	$35.00
Light rails (from rail steel) per gross ton	34.00

Base per 100 Lb.

Spikes, 9/16 in. and larger	$3.40
Spikes, ½ in. and smaller	3.40
Spikes, boat and barge	3.40
Tie plates, steel	1.90
Track bolts, to steam railroads	3.55
Track bolts, no jobbers, all sizes (per 100 count)	70 per cent off list

Basing points on light rails are Pittsburgh, Chicago and Birmingham; on spikes and tie plates, Pittsburgh, Chicago, Buffalo, Portsmouth, Ohio, Weirton, W. Va., St. Louis, Kansas City, Minneapolis, Colo., Birmingham and Pacific Coast ports; on tie plates alone, Steelton, Pa.; on spikes alone, Cleveland, Youngstown, Lebanon, Pa., Columbia, Pa., Richmond, Va., Jersey City, N. J.

BOLTS, NUTS, RIVETS AND SET SCREWS

Bolts and Nuts

(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

	Per Cent Off List
Machine bolts	70, 10, 10 and 10
Carriage bolts	70, 10, 10 and 10
Lag bolts	70, 10 10 and 10
Plow bolts, Nos. 1, 2, 3 and 7 heads	70, 10, 10 and 10
Hot-pressed nuts, blank or tapped, square	70, 10, 10 and 10
Hot-pressed nuts, blank or tapped, hexagons	70, 10, 10 and 10
C.p.c. and t. square or hex. nuts, blank or tapped	70, 10, 10 and 10
Semi-finished hexagon nuts, U.S.S. all sizes	70, 10, 10 and 10
Semi-finished hexagon nuts, S.A.E. ¼ in. to 7/16 in. diameter	70, 10, 10 and 10
½ in. to 1 in. diameter	70, 10, 10 and 10
larger than 1 in. diameter	70, 10, 10 and 10
Stove bolts in packages, Pittsburgh	75
Stove bolts in packages, Chicago	75
Stove bolts in packages, Cleveland	75
Stove bolts in bulk, P'gh	83
Stove bolts in bulk, Chicago	83
Stove bolts in bulk, Cleveland	83
Tire bolts	60 and 10

Large Rivets

(½-in. and larger)

	Base per 100 Lb.
F.o.b. Pittsburgh or Cleveland	$2.90
F.o.b. Chicago	3.00
F.o.b. Birmingham	3.05

Small Rivets

(7/16-in. and smaller)

	Per Cent Off List
F.o.b. Pittsburgh	70 and 5
F.o.b. Cleveland	70 and 5
F.o.b. Chicago and Birm'g'm	70 and 5

Cap and Set Screws

(Freight allowed up to but not exceeding 65c. per 100 lb. on lots of 200 lb. or more)

	Per Cent Off List
Milled cap screws, 1 in. dia. and smaller	85
Milled standard set screws, case hardened, 1 in. dia. and smaller	75 and 10
Milled headless set screws, cut thread ⅝ in. and smaller	75 and 10
Upset hex. head cap screws, U.S.S.S. or S.A.E. thread, 1 in. dia. and smaller	85 and 10
Upset set screws, cut and oval point	80
Milled studs	65 and 10

Alloy and Stainless Steel

Alloy Steel Ingots

F.o.b. Pittsburgh, Chicago, Canton, Massillon, Buffalo, Bethlehem.
Uncropped.....$40 per gross ton

Alloy Steel Blooms, Billets and Slabs

F.o.b. Pittsburgh, Chicago, Canton, Massillon, Buffalo, Bethlehem.
Base price, $49 a gross ton.
Price del'd Detroit is $52.

Alloy Steel Bars

F.o.b. Pittsburgh, Chicago, Buffalo, Bethlehem, Massillon or Canton.
Open-hearth grade, base.....2.45c.
Delivered price at Detroit is.....2.60c.

S.A.E. Series Numbers	Alloy Differential per 100 lb.
2000 (1½% Nickel)	$0.25
2100 (2½% Nickel)	0.55
2300 (3½% Nickel)	1.50
2500 (5% Nickel)	2.25
3100 Nickel Chromium	0.55
3200 Nickel Chromium	1.35
3300 Nickel Chromium	3.80
3400 Nickel Chromium	3.20
4100 Chromium Molybdenum (0.15 to 0.25 Molybdenum)	0.50
4100 Chromium Molybdenum (0.25 to 0.40 Molybdenum)	0.70
4600 Nickel Molybdenum (0.20 to 0.30 Molybdenum) (1.50 to 2.00 Nickel)	1.05
5100 Chromium Steel (0.60 to 0.90 Chromium)	0.35
5100 Chromium Steel (0.80 to 1.10 Chromium)	0.45
5100 Chromium Spring Steel	base
6100 Chromium Vanadium Bar	1.20
4100 Chromium Vanadium Spring Steel	0.95
Chromium Nickel Vanadium	1.50
Carbon Vanadium	0.95

These prices are for hot-rolled steel bars. The differential for most grades in electric furnace steel is 50c. higher. The differential for cold-drawn bars is ½c. per lb. higher with separate extras. Blooms, billets and slabs under 4x4 in. or equivalent are sold on the bar base. Slabs with a section area of 16 in. and 2½ in. thick or over take the billet base. Sections 4x4 in. to 10x10 in. or equivalent carry a gross ton price, which is the net price for bars for the same analysis. Larger sizes carry extras.

Alloy Cold-Finished Bars

F.o.b. Pittsburgh, Chicago, Gary, Cleveland or Buffalo, 2.95c. base per lb.

STAINLESS STEEL No. 302

(17 to 19% Cr, 7 to 9% Ni, 0.08 to 0.20% C)

(Base Prices, f.o.b. Pittsburgh)

	Per Lb.
Bars	23c.
Plates	26c.
Sheets	33c.
Hot-rolled strip	20¾c.
Cold-rolled strip	27c.

Raw and Semi-Finished Steel

Carbon Steel Rerolling Ingots

F.o.b. Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham.
Uncropped.....$29 per gross ton

Carbon Steel Forging Ingots

F.o.b. Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Birmingham.
Uncropped.....$31 per gross ton

Billets, Blooms and Slabs

F.o.b. Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham.

	Per Gross Ton
Rerolling	$27.00
Forging quality	32.00

Delivered Detroit

Rerolling	$30.00
Forging	35.00

Billets Only F.o.b. Duluth

Rerolling	$29.00
Forging	34.00

Sheet Bars

F.o.b. Pittsburgh, Chicago, Cleveland, Youngstown, Buffalo, Canton, Sparrows Point, Md.

	Per Gross Ton
Open-hearth or Bessemer	$28.00

Skelp

F.o.b. Pittsburgh, Chicago, Youngstown, Buffalo, Coatesville, Pa., Sparrows Point, Md.

	Per Lb.
Grooved	1.70c.
Universal	1.70c.
Sheared	1.70c.

Tube Rounds

	Base per Lb.
F.o.b. Pittsburgh	1.80c.
F.o.b. Chicago	1.85c.
F.o.b. Cleveland	1.85c.
F.o.b. Buffalo	1.90c.
F.o.b. Birmingham	1.95c.

Wire Rods

(Common soft, base)

	Per Gross Ton
F.o.b. Pittsburgh	$38.00
F.o.b. Cleveland	38.00
F.o.b. Chicago	39.00
F.o.b. Anderson, Ind.	39.00
F.o.b. Youngstown	39.00
F.o.b. Worcester, Mass.	40.00
F.o.b. Birmingham	41.00
F.o.b. San Francisco	47.00

Pig Iron and Ferroalloys

PIG IRON

PRICES PER GROSS TON AT BASING POINTS

Basing Points	No. 2 Fdry.	Malleable	Basic	Bessemer
Everett, Mass.	$19.50	$20.00	$19.00	$20.50
Bethlehem, Pa.	19.50	20.00	19.00	20.50
Birdsboro, Pa.	19.50	20.00	19.00	20.50
Swedeland, Pa.	19.50	20.00	19.00	20.50
Steelton, Pa.	.....	.....	19.00	.....
Sparrows Point, Md.	19.50	.....	19.00	.....
Neville Island, Pa.	18.50	18.50	18.00	19.00
Sharpsville, Pa.	18.50	18.50	18.00	19.00
Youngstown	18.50	18.50	18.00	19.00
Buffalo	18.50	19.00	17.50	19.50
Erie, Pa.	18.50	19.00	18.00	19.50
Cleveland	18.50	18.50	18.00	19.00
Toledo, Ohio	18.50	18.50	18.00	19.00
Jackson, Ohio	20.25	20.25	19.75	.....
Detroit	18.50	18.50	18.00	19.00
Hamilton, Ohio	18.50	18.50	18.00	19.00
Chicago	18.50	18.50	18.00	19.00
Granite City, Ill.	18.50	18.50	18.00	.....
Duluth, Minn.	19.00	19.00	.....	19.50
Birmingham	14.50	14.50	13.50	19.00
Provo, Utah	17.50	.....	.....	.....

DELIVERED PRICES PER GROSS TON AT CONSUMING CENTERS

	No. 2 Fdry.	Malleable	Basic	Bessemer
Boston Switching District				
From Everett, Mass.	$20.00	$20.50	$19.50	$21.00
Brooklyn				
From East Pa. or Buffalo	21.77	22.27	21.27	22.77
Newark or Jersey City, N. J.				
From East. Pa. or Buffalo	20.89	21.39	20.39	21.89
Philadelphia				
From Eastern Pa.	20.26	20.76	19.76	21.26
Cincinnati				
From Hamilton, Ohio	19.51	19.51	19.01	20.01
Canton, Ohio				
From Cleveland and Youngstown	19.76	19.76	19.26	20.26
Columbus, Ohio				
From Hamilton, Ohio	20.50	20.50	.....	.....
Mansfield, Ohio				
From Cleveland and Toledo	20.26	20.26	.....	.....
Indianapolis				
From Hamilton, Ohio	20.77	20.77	.....	.....
South Bend, Ind.				
From Chicago	20.55	20.55	.....	.....
Milwaukee				
From Chicago	19.50	19.50	.....	.....
St. Paul				
From Duluth	20.94	.....	.....	.....
Davenport, Iowa				
From Chicago	20.26	20.26	.....	.....
Kansas City				
From Granite City	21.04	21.04	.....	.....

Delivered prices on Southern iron for shipment to Northern points are 38c. a gross ton below delivered prices from the nearest Northern basing points.

LOW PHOSPHORUS PIG IRON

Basing points: Birdsboro, Pa., Steelton, Pa., and Standish, N. Y.....$23.50

Johnson City, Tenn.	23.50
Del'd Chicago	29.15
Johnson City, Tenn. (off grade)	19.50

GRAY FORGE PIG IRON

Valley furnace	$18.00
Pittsburgh district furnace	18.00

CHARCOAL PIG IRON

Lake Superior furnace	$21.00
Delivered Chicago	24.04
Delivered Buffalo	24.28

CANADA

Pig Iron

Per gross ton:

Delivered Toronto

No. 1 fdy., sil. 2.25 to 2.75	$21.00
No. 2 fdy., sil. 1.75 to 2.75	20.50
Malleable	21.00

Delivered Montreal

No. 1 fdy., sil. 2.25 to 2.75	$22.50
No. 2 fdy., sil. 1.75 to 2.25	22.00
Malleable	22.50
Basic	22.00

FERROALLOYS

Ferromanganese

F.o.b. New York, Philadelphia, Baltimore, Mobile or New Orleans.

	Per Gross Ton
Domestic, 80% (carload)	$85.00

Spiegeleisen

	Per Gross Ton Furnace
Domestic, 19 to 21%	$26.00

Electric Ferrosilicon

	Per Gross Ton Delivered
50% (carloads)	$77.50
50% (ton lots)	85.00
75% (carloads)	126.00
75% (ton lots)	136.00
14% to 16% (f.o.b.) Welland, Ont. (in carloads) (duty paid)	31.00
14% to 16% (less carloads)	38.50

Silvery Iron

F.o.b. Jackson, Ohio, Furnace

Per Gross Ton		*Per Gross Ton*	
6%	$22.75	12%	$29.25
7%	23.75	13%	30.75
8%	24.75	14%	32.25
9%	25.75	15%	33.75
10%	26.75	16%	35.25
11%	27.75	17%	36.75

The lower all-rail delivered price from Jackson or Buffalo is quoted with freight allowed.

Bessemer Ferrosilicon

F.o.b. Jackson, Ohio, Furnace

Per Gross Ton		*Per Gross Ton*	
10%	$27.75	14%	$33.25
11%	28.75	15%	34.75
12%	30.25	16%	36.25
13%	31.75	17%	37.75

Manganese 1½ to 3%, $1 a ton additional. For each unit of manganese over 3%, $1 a ton additional. Phosphorus 0.75% or over, $1 ton additional.

Base prices at Buffalo are $1.25 a ton higher than at Jackson.

Other Ferroalloys

Ferrotungsten, per lb. contained W, del., carloads	$1.35 to $1.45
Ferrotungsten, less carloads	1.45 to 1.55
Ferrochromium, 4 to 6% carbon and up, 65 to 70% Cr. per lb. contained Cr. delivered, in carloads	10.00c.
Ferrochromium, 2% carbon	16.50c. to 17.00c.
Ferrochromium, 1% carbon	17.50c. to 18.00c.
Ferrochromium, 0.10% carbon	19.50c. to 20.00c.
Ferrochromium, 0.06% carbon	20.00c. to 20.50c.
Ferrovanadium, del., per lb. contained V	$2.70 to $2.90
Ferrocarbontitanium, 15 to 18% Ti, 6 to 8% C, f.o.b. furnace carload and contract per net ton	$137.50
Ferrophosphorus, electric, or blast furnace material, in carloads, 18%, Rockdale, Tenn., base, per gross ton with $2 unitage	50.00
Ferrophosphorus, electric, 24% f.o.b. Anniston, Ala., per gross ton with $2.75 unitage	65.00
Ferromolybdenum, per lb. Mo., del.	95c.
Calcium molybdate, per lb. Mo., del.	80c.
Silico spiegel, per ton, f.o.b. furnace, car lots	$38.00
Ton lots or less per ton	45.50
Silico-manganese, gross ton, delivered:	
2.50% carbon grade	90.00
2% carbon grade	95.00
1% carbon grade	105.00
Spot prices	$5 a ton higher

Iron and Steel Scrap

PITTSBURGH

Per gross ton delivered consumers' yards:

No. 1 heavy melting steel	$10.50 to $11.00
No. 2 heavy melting steel	9.50 to 10.00
No. 2 railroad wrought	10.50 to 11.00
Scrap rails	10.50 to 11.00
Rails 3 ft. and under	13.50 to 14.00
Compressed sheet steel	10.25 to 10.75
Hand bundled sheet steel	9.50 to 10.00
Hvy. steel axle turnings	9.00 to 9.50
Machine shop turnings	7.00 to 7.50
Short shov. turnings	7.00 to 7.50
Short mixed borings and turnings	5.25 to 5.75
Cast iron borings	5.25 to 5.75
Cast iron carwheels	11.00 to 11.50
Heavy breakable cast	10.00 to 10.50
No. 1 cast	11.25 to 11.75
Railr. knuckles and couplers	13.50 to 14.00
Rail, coil and leaf springs	13.50 to 14.00
Rolled steel wheels	13.50 to 14.00
Low phos. billet crops	13.75 to 14.25
Low phos. sheet bar crops	13.75 to 14.25
Low phos. plate scrap	13.00 to 13.50
Low phos. punchings	13.00 to 13.50
Steel car axles	13.00 to 13.50

CHICAGO

Delivered Chicago district consumers:

Per Gross Ton

Heavy melting steel	$9.00
Automobile hvy. melt. steel	$8.00 to 8.50
Shoveling steel	8.50 to 9.00
Hydraulic comp. sheets	7.50 to 8.00
Drop forge flashings	6.50 to 7.00
No. 1 busheling	7.00 to 7.50
Rolled carwheels	10.75 to 11.25
Railroad tires	10.75 to 11.25
Railroad leaf springs	10.75 to 11.25
Axle turnings	8.00 to 8.50
Steel couplers and knuckles	10.50 to 11.00
Coil springs	10.50 to 11.00
Axle turnings (elec. fur.)	8.00 to 8.50
Low phos. punchings	10.00 to 10.50
Low phos. plates, 12 in. and under	10.00 to 10.50
Cast iron borings	4.50 to 5.00
Short shoveling turnings	4.50 to 5.00
Machine shop turnings	4.25 to 4.75
Rerolling rails	10.00 to 10.50
Steel rails, less than 3 ft.	10.75 to 11.25
Steel rails, less than 2 ft.	11.50 to 12.00
Angle bars, steel	9.50 to 10.00
Cast iron carwheels	10.00 to 10.50
Railroad malleable	9.00 to 9.50
Agricultural malleable	7.75 to 8.25

Per Net Ton

Iron car axles	$12.00 to $12.50
Steel car axles	10.00 to 10.50
No. 1 railroad wrought	8.00 to 8.50
No. 2 railroad wrought	7.50 to 8.00
No. 2 busheling	3.50 to 4.00
Locomotive tires, smooth	9.00 to 9.50
Pipe and flues	4.50 to 5.00
No. 1 machinery cast	8.00 to 8.50
Clean automobile cast	8.50 to 9.00
No. 1 railroad cast	7.00 to 7.50
No. 1 agricultural cast	7.00 to 7.50
Stove plate	5.25 to 5.75
Grate bars	4.75 to 5.25
Brake shoes	6.00 to 6.50

PHILADELPHIA

Per gross ton delivered consumers' yards:

No. 1 heavy melting steel	$9.25 to $10.00
No. 2 heavy melting steel	8.25 to 8.75
No. 1 railroad wrought	$11.00 to 11.50
Bundled sheets	.... 9.00
Hydraulic compressed, new	9.00 to 9.50
Hydraulic compressed, old	6.50 to 7.00
Machine shop turnings	5.00 to 5.50
Heavy axle turnings	8.50 to 9.00
Cast borings	5.00 to 5.50
Heavy breakable cast	9.50 to 10.00
Stove plate (steel works)	.... 8.00
No. 1 low phos. heavy	13.00 to 14.00
Couplers and knuckles	13.00 to 13.50
Rolled steel wheels	13.00 to 13.50
No. 1 blast furnace	5.00 to 5.50
Spec. iron and steel pipe	.... 8.00
Shafting	15.25 to 16.25
Steel axles	15.50 to 16.00
No. 1 forge fire	.... 9.00
Cast iron car wheels	10.25 to 10.75
No. 1 cast	10.50 to 11.50
Cast borings (chem.)	12.00 to 14.00
Steel rails for rolling	.... 12.00

CINCINNATI

Dealers' buying prices per gross ton:

Heavy melting steel	$6.75 to $7.25
Scrap rails for melting	8.00 to 8.50
Loose sheet clippings	3.00 to 3.50
Bundled sheets	5.50 to 6.00
Cast iron borings	4.50 to 5.00
Machine shop turnings	4.00 to 4.50
No. 1 busheling	5.50 to 6.00
No. 2 busheling	2.50 to 3.00
Rails for rolling	8.50 to 9.00
No. 1 locomotive tires	8.25 to 8.75
Short rails	11.00 to 11.50
Cast iron carwheels	7.50 to 8.00
No. 1 machinery cast	8.75 to 9.25
No. 1 railroad cast	8.25 to 8.75
Burnt cast	5.75 to 6.25
Stove plate	5.75 to 6.25
Agricultural malleable	7.75 to 8.25
Railroad malleable	7.75 to 8.25

CLEVELAND

Per gross ton delivered consumers' yards:

No. 1 heavy melting steel	$8.50 to $9.00
No. 2 heavy melting steel	8.00 to 8.50
Compressed sheet steel	7.25 to 7.75
Light bundled sheet stampings	6.50 to 7.00
Drop forge flashings	7.50 to 8.00
Machine shop turnings	6.00 to 6.50
Short shoveling turnings	6.50 to 7.00
No. 1 busheling	7.50 to 8.00
Steel axle turnings	7.00 to 7.50
Low phos. billet crops	12.50 to 13.00
Cast iron borings	6.25 to 6.75
Mixed borings and short turnings	6.25 to 6.75
No. 2 busheling	6.25 to 6.75
No. 1 cast	10.50 to 11.00
Railroad grate bars	7.00 to 7.50
Stove plate	6.50 to 7.00
Rails under 3 ft.	12.50 to 13.00
Rails for rolling	15.50 to 18.00
Railroad malleable	11.50 to 12.00
Cast iron carwheels	9.75 to 10.00

BUFFALO

Per gross ton, f.o.b. Buffalo consumers' plants:

No. 1 heavy melting steel	$10.00 to $10.50
No. 2 heavy melting scrap	8.50 to 9.00
Scrap rails	9.50 to 10.00
New hydraul. comp. sheets	8.50 to 9.00
Old hydraul. comp. sheets	7.50 to 8.00
Drop forge flashings	8.50 to 9.00
No. 1 busheling	8.50 to 9.00
Hvy. steel axle turnings	6.50 to 7.00
Machine shop turnings	5.00 to 5.50
Knuckles and couplers	11.00 to 11.50
Coil and leaf springs	11.00 to 11.50
Rolled steel wheels	11.00 to 11.50
Low phos. billet crops	11.50 to 12.00
Short shov. steel turnings	5.50 to 6.00
Short mixed borings and turnings	5.50 to 6.00
Cast iron borings	5.50 to 6.00
No. 2 busheling	5.00 to 5.50
Steel car axles	10.50 to 11.00
Iron axles	10.50 to 11.00
No. 1 machinery cast	10.50 to 11.00
No. 1 cupola cast	9.00 to 9.50
Stove plate	8.50 to 8.75
Steel rails, 3 ft. and under	12.00 to 12.50
Cast iron carwheels	10.00 to 10.50
Industrial malleable	10.50 to 11.00
Railroad malleable	10.50 to 11.00
Chemical borings	7.00 to 7.50

BOSTON

Dealers' buying prices per gross ton:

No. 1 heavy melting steel	$5.50 to $6.00
Scrap T rails	5.50 to 6.00
No. 2 steel	5.00 to 5.25
Breakable cast	6.00 to 6.50
Machine shop turnings	1.50 to 1.75
Bundled skeleton, long	4.00 to 4.25
Forge flashings	4.25 to 4.50
Blast furnace scrap	2.00 to 2.50
Shafting	11.00 to 11.25
Steel car axles	10.50 to 11.00
Cast iron borings, chemical	6.00 to 7.00
Stove plate	.... 6.50

Per gross ton delivered consumers' yards:

Textile cast	$7.50 to $9.00
No. 1 machinery cast	7.50 to 9.00
Railroad malleable	11.00 to 11.50

NEW YORK

Dealers' buying prices per gross ton:

No. 1 heavy melting steel	*$7.00 †$8.00
No. 2 heavy melting steel	*5.50 to †6.50
Heavy breakable cast	6.00 to 6.50
No. 1 machinery cast	7.00 to 7.50
No. 2 cast	6.25 to 6.75
Stove plate	5.50 to 6.00
Steel car axles	11.50 to 12.00
No. 1 railroad wrought	7.50 to 8.00
No. 1 yard wrought, long	6.50 to 7.00
Spec. iron and steel pipe	4.50 to 5.00
Forge fire	5.50 to 6.00
Rails for rerolling	8.00 to 8.75
Short shoveling turnings	2.50 to 3.00
Machine shop turnings	2.50 to 3.00
Cast borings	3.50 to 3.75
No. 1 blast furnace	2.00 to 2.50
Cast borings (chemical)	11.00 to 11.50
Unprepared yard iron and steel	3.50 to 4.00

Per gross ton, delivered local foundries:

No. 1 machinery cast	$10.25
No. 1 hvy. cast (cupola size)	9.00
No. 2 cast	8.00

*For direct car loading only.
†Loading on barge.

BIRMINGHAM

Per gross ton delivered consumers' yards:

Heavy melting steel	.... $9.00
Scrap steel rails	.... 10.00
Short shoveling turnings	.... 6.50
Stove plates	.... 6.50
Steel axles	$10.50 to 11.00
Iron axles	10.50 to 11.00
No. 1 railroad wrought	.... 5.50
Rails for rolling	.... 11.00
No. 1 cast	.... 10.50
Tramcar wheels	9.00 to 9.50
Cast iron borings, chem.	.... 8.00

ST. LOUIS

Per gross ton delivered consumers' yards:

Selected heavy steel	$8.75 to $9.25
No. 1 heavy melting	7.00 to 7.50
No. 2 heavy melting	6.00 to 6.50
No. 1 locomotive tires	9.50 to 10.00
Misc. stand-sec. rails	8.50 to 9.00
Railroad springs	8.50 to 9.00
Bundled sheets	6.00 to 6.50
No. 2 railroad wrought	7.50 to 8.00
No. 1 busheling	5.00 to 5.50
Cast iron borings and shoveling turnings	2.50 to 3.00
Rails for rolling	9.25 to 9.75
Machine shop turnings	2.50 to 3.00
Heavy turnings	5.50 to 6.00
Steel car axles	11.00 to 11.50
Iron car axles	12.50 to 13.00
No. 1 railroad wrought	5.50 to 6.00
Steel rails less than 3 ft.	10.75 to 11.25
Steel angle bars	9.00 to 9.50
Cast iron carwheels	7.00 to 7.50
No. 1 machinery cast	8.50 to 9.00
Railroad malleable	8.50 to 9.00
No. 1 railroad cast	8.50 to 9.00
Stove plate	6.50 to 7.00
Agricult. malleable	8.50 to 9.00

DETROIT

Dealers' buying prices per gross ton:

Heavy melting steel	$7.00 to $7.50
Borings and short turnings	5.00 to 5.50
Long turnings	$3.75 to $4.25
No. 1 machinery cast	9.50 to 10.00
Automotive cast	10.00 to 10.50
Hydraul. comp. sheets	7.00 to 7.50
Stove plate	6.25 to 6.75
New factory busheling	6.00 to 6.50
Old No. 2 busheling	4.00 to 4.50
Sheet clippings	3.50 to 4.00
Flashings	6.00 to 6.50
Low phos. plate scrap	7.50 to 8.00

CANADA

Dealers' buying prices per gross ton:

	Toronto	Montreal
Heavy melting steel	$5.50	$5.50
Rails scrap	6.00	4.50
Machine shop turnings	2.50	2.50
Boiler plate	4.50	4.50
Heavy axle turnings	2.50	2.50
Cast borings	3.00	3.00
Steel borings	2.00	2.00
Wrought pipe	2.50	2.50
Steel axles	4.50	6.00
Axles wrought iron	4.50	6.50
No. 1 machinery cast	7.75	9.00
Stove plate	4.50	5.00
Standard carwheels	7.25	7.00
Malleable	6.75	7.00

ORES, FLUORSPAR, COKE, FUEL, REFRACTORIES

Lake Superior Ores

Delivered Lower Lake Ports

Per Gross Ton

Old range, Bessemer, 51.5% iron	$4.80
Old range, non-Bessemer, 51.50% iron	4.65
Mesabi, Bessemer, 51.50% iron	4.65
Mesabi, non-Bessemer, 51.50% iron	4.50
High phosphorus, 51.50% iron	4.40

Foreign Ore

C.i.f. Philadelphia or Baltimore

Per Unit

Iron, low phos., copper free, 55 to 58% iron, dry Spanish or Algeria	9.50c.
Iron, low phos., Swedish, average 68½% iron	9.50c.
Iron, basic or foundry, Swedish, aver. 65% iron	9c.
Iron, basic or foundry, Russian, aver. 65% iron	9c.
Manganese, Caucasian, washed 52%	26c.
Manganese, African, Indian, 44-48%	21c.
Manganese, African, Indian, 49-51%	24c.
Manganese, Brazilian, 46 to 48½	20c.

Per Net Ton Unit

Tungsten, Chinese, wolframite, duty paid, delivered*	$17.50 to $18.50
Tungsten, domestic scheelite, delivered†	17.00

Per Gross Ton

Chrome, 45%, Cr_2O_3, crude, c.i.f. Atlantic Seaboard	$17.00
Chrome, 48%, Cr_2O_3, c.i.f. Atlantic Seaboard	20.00

*Quotations nominal in absence of sales.
†Nominal; no supplies available.

Fluorspar

Per Net Ton

Domestic, washed gravel, 85-5 f.o.b. Kentucky and Illinois mines for all-rail shipment	$15.50 to $16.00
Same grade for Ohio River barge shipment for Kentucky and Illinois River landings	17.50
No. 2 lump, 85-5, f.o.b. Kentucky and Illinois mines	$15.50 to 16.00
Foreign, 85% calcium fluoride, not over 5% silicon, c.i.f. Atlantic port, duty paid	19.00
Domestic, No. 1 ground bulk, 95 to 98% calcium fluoride, not over 2½% silicon, f.o.b. Illinois and Kentucky mines	30.00

COKE, COAL AND FUEL OIL

Coke

Per Net Ton

Furnace, f.o.b. Connellsville Prompt	$3.85
Foundry, f.o.b. Connellsville Prompt	$4.60 to 5.10
Foundry, by-product, Chicago ovens, for delivery outside switching district	8.50
Foundry, by-product, delivered in Chicago switching district	9.25
Foundry, by-product, New England, delivered	11.00
Foundry, by-product, Newark or Jersey City, del'd	8.20 to 8.81
Foundry, by-product, Phila.	9.00
Foundry, by-product, Cleveland, delivered	$9.25
Foundry, Birmingham	6.00
Foundry, by-product, St. Louis, f.o.b. ovens	8.00
Foundry, by-product, del'd St. Louis	9.00

Coal

Per Net Ton

Mine run steam coal, f.o.b. W. Pa. mines	$1.80 to $2.00
Mine run coking coal f.o.b. W. Pa.	2.05 to 2.25
Gas coal, ¾-in. f.o.b. Pa. mines	2.25 to 2.35
Mine run gas coal f.o.b. Pa. mines	2.05 to 2.05
Steam slack, f.o.b. W. Pa. mines	1.55 to 1.65
Gas slack, f.o.b. W. Pa. mines	1.90 to 2.10

Fuel Oil

Per Gal. f.o.b. Bayonne, N. J.

No. 3 distillate	4.00c.
No. 4 industrial	3.50c.

Per Gal. f.o.b. Baltimore

No. 3 distillate	4.00c.
No. 4 industrial	3.50c.

Per Gal. del'd Chicago

No. 3 industrial fuel oil	3.85c.
No. 5 industrial fuel oil	3.35c.

Per Gal. f.o.b. Cleveland

No. 3 distillate	5.50c.
No. 4 industrial	5.25c.
No. 5 industrial	4.00c.

REFRACTORIES

Fire Clay Brick

Per 1000 f.o.b. Works

	High-heat Duty Brick	Intermediate Duty Brick
Pennsylvania	$45.00	$40.00
Maryland	45.00	40.00
New Jersey	55.00	45.00
Ohio	45.00	40.00
Kentucky	45.00	40.00
Missouri	45.00	40.00
Illinois	45.00	40.00
Ground fire clay, per ton	7.00	

Chrome Brick

Per Net Ton

Standard size	$45.00

Silica Brick

Per 1000 f.o.b. Works

Pennsylvania	$45.00
Chicago	54.00
Birmingham	55.00
Silica clay, per ton	8.00

Magnesite Brick

Per Net Ton

Standard size, burned, f.o.b. Baltimore and Chester, Pa.	$65.00
Unburned, f.o.b. Baltimore	55.00
Imported grain magnesite, f.o.b. Baltimore and Chester, Pa.	45.00
Domestic grain magnesite, f.o.b. Baltimore and Chester, Pa.	40.00
Domestic, f.o.b. Chewelah, Wash.	22.00

Warehouse Prices for Steel Products

PITTSBURGH

	Base per Lb.
Plates	3.15c.
Structural shapes	3.15c.
Soft steel bars and small shapes	2.90c.
Reinforcing steel bars	2.90c.
Cold-finished and screw stock—	
Rounds and hexagons	*3.45c.
Squares and flats	*3.45c.
Hoops and bands under ¼ in.	3.20c.
Hot-rolled annealed sheets (No. 24), 25 or more bundles	3.30c.
Galv. sheets (No. 24), 25 or more bundles	3.95c.
Hot-rolled sheets (No. 10)	2.95c.
Galv. corrug. sheets (No. 28), per square (more than 3750 lb.)	$3.69
Spikes, large	2.90c.
Track bolts, all sizes, per 100 count,	65 per cent off list.
Machine bolts, 100 count,	65 per cent off list.
Carriage bolts, 100 counts,	65 per cent off list.
Nuts, all styles, 100 count,	65 per cent off list.
Large rivets, base per 100 lb.	$3.50
Wire, black, soft ann'l'd, base per 100 lb.	*2.70
Wire, galv. soft, base per 100 lb.	*2.925
Common wire nails, per keg	*2.834
Cement coated nails, per keg	*2.834

On plates, structurals, bars, reinforcing bars, bands, hoops and blue annealed sheets, base applied to orders of 400 to 9999 lb.

*Delivered in Pittsburgh switching district.

CHICAGO

	Base per Lb.
Plates and structural shapes	3.20c.
Soft steel bars	2.95c.
Cold-fin. steel bars:	
Rounds and hexagons	3.50c.
Flats and squares	3.50c.
Hot-rolled strip	3.30c.
Hot-rolled annealed sheets (No. 24)	3.85c.
Galv. sheets (No. 24)	4.55c.
Hot-rolled sheets (No. 10)	3.05c.
Spikes (keg lots)	3.50c.
Track bolts (keg lots)	4.65c.
Rivets, structural (keg lots)	3.65c.
Rivets, boiler (keg lots)	3.75c.
	Per Cent Off List
Machine bolts	60 and 5
Carriage bolts	60 and 5
Lag screws	60 and 5
Hot-pressed nuts, sq. tap. or blank	60 and 5
Hot-pressed nuts, hex. tap or blank	60 and 5
Hex. head cap screws	80
Cup point set screws	70 and 10
Flat head bright wood screws	37½ and 10
Spring cotters	50
Stove bolts in full packages	70
Rd. hd. tank rivets, 7/16 in. and smaller	57½
Wrought washers	$4.50 off list
No. 8 black ann'l'd wire per 100 lb.	$3.85
Com. wire nails, base per keg	3.05
Cement c't'd nails, base per keg	3.05

On plates, shapes, bars, hot-rolled strip and heavy hot-rolled sheets, the base applies on orders of 400 to 9999 lb. All prices are f.o.b. consumers' plants within the Chicago switching district.

NEW YORK

	Base per Lb.
Plates, ¼ in. and heavier	3.40c.
Structural shapes	3.37c.
Soft steel bars, small shapes	3.22c.
Iron bars	3.22c.
Iron bars, swed. charcoal	6.50c. to 7.25c.
Cold-fin. shafting and screw stock:	
Rounds and hexagons	3.92c.
Flats and squares	4.42c.
Cold-roll. strip, soft and quarter hard	3.32c.
Hoops	3.52c.
Bands	3.52c.
Hot-rolled sheets (No. 10)	3.27c.
Hot-rolled ann'l'd sheets (No. 24*)	3.85c.
Galvanized sheets (No. 24*)	4.50c.
Long terne sheets (No. 24)	5.20c.
Standard tool steel	11.00c.
Wire, black annealed (No. 10)	3.25c.
Wire, galv. (No. 10)	3.85c.
Tire steel, 1 x ¼ in. and larger	3.65c.
Open hearth spring steel	4.00c. to 10.00c.
Common wire nails, base, per keg	$3 21
	Per Cent
Machine bolts, cut thread:	Off List
All diameters	70
Carriage bolts, cut thread:	
All diameters	70
Boiler tubes:	Per 100 Ft.
Lap welded, 2-in.	$18.05
Seamless welded, 2-in.	19.24
Charcoal iron, 2-in.	24.94
Charcoal iron, 4-in.	63.65

*No. 28 and lighter, 36 in. wide, 20c. higher per 100 lb.

ST. LOUIS

	Base per Lb.
Plates and struc. shapes	3.44c.
Bars, soft steel or iron	3.19c.
Cold-fin. rounds, shafting, screw stock	3.74c.
Hot-rolled annealed sheets (No. 24)	4.09c
Galv. sheets (No. 24)	4.79c.
Hot-rolled sheets (No. 10)	3.29c.
Black corrug. sheets (No. 24)	4.09c.
*Galv. corrug. sheets	4.79c.
Structural rivets	3.99c.
Boiler rivets	4.09c.
	Per Cent Off List
Tank rivets, 7/16 in. and smaller	55
Machine and carriage bolts, lag screws, fittings up bolts, bolt ends, plow bolts, hot-pressed nuts, square and hexagon, tapped or blank, semi-finished nuts:	
1000 lb. or over	70 and 10
200 to 999 lb.	67½ and 10
100 to 199 lb.	65 and 10
Less than 100 lb.	60 and 10

*No. 26 and lighter take special prices.

PHILADELPHIA

	Base per Lb.
*Plates, ¼-in. and heavier	2.95c.
*Structural shapes	2.95c.
*Soft steel bars, small shapes, iron bars (except bands)	2.90c.
‡Reinforc. steel bars, sq. twisted and deformed	2.955c.
Cold-finished steel bars	3.73c.
*Steel hoops	3.40c.
*Steel bands, No. 12 and 3/16 in., incl.	3.15c.
Spring steel	5.00c.
†Hot-rolled anneal. sheets (No. 24)	3.55c.
†Galvanized sheets (No. 24)	4.25c.
*Hot-rolled annealed sheets (No. 10)	3.05c.
Diam. pat. floor plates, ¼ in.	4.95c.
Swedish iron bars	6.25c.

These prices are subject to quantity differentials except on reinforcing and Swedish iron bars.

*Base prices subject to deduction on orders aggregating 4000 lb. or over.

†For 50 bundles or over.

‡For less than 2000 lb.

CLEVELAND

	Base per Lb.
Plates and struc. shapes	3.31c.
Soft steel bars	2.95c.
Reinforc. steel bars	*2.10c.
Cold-finished steel bars	3.40c.
Flat-rolled steel under ¼ in.	3.36c.
Cold-finished strip	†3.00c.
Hot-rolled annealed sheets (No. 24)	3.96c.
Galvanized sheets (No. 24)	4.61c.
Hot rolled sheets (No. 10)	3.11c.
Hot-rolled 3/16 in. 24 to 48 in. wide sheets	3.56c.
Black ann'l'd wire, per 100 lb.	$2.65
No. 9 galv. wire, per 100 lb.	3.90
Com. wire nails, base per keg	2.40

*Plus mill, size and quantity extras.

†Outside delivery 10c. less.

CINCINNATI

	Base per Lb.
Plates and struc. shapes	3.40c.
Bars, soft steel or iron	3.15c.
New billet reinforc. bars	3.25c.
Rail steel reinforc. bars	3.25c.
Hoops and bands, 3/16 in. and lighter	3.45c.
Cold-finished bars	3.70c.
Hot-rolled annealed sheets (No. 24)	4.00c.
Galv. sheets (No. 24)	4.70c.
Hot-rolled sheets (No. 10)	3.20c.
Structural rivets	4.35c.
Small rivets	55 per cent off list
No. 9 ann'l'd wire, per 100 lb. (1000 lb. or over)	$2.91
Com. wire nails, base per keg (1 to 24 kegs)	3.50
25 to 50 kegs	3.30
Larger quantities	3.10
Cement c't'd nails, base 100-lb. keg	3.50
Chain, 1-in., per 100 lb.	8.35
	Net per 100 Ft.
Seamless steel boiler tubes, 2-in.	$19.03
4-in.	44.96
Lap-welded steel boiler tubes, 2-in.	18.10
4-in.	42.32

BUFFALO

	Base per Lb.
Plates	3.37c.
Struc. shapes	3.25c.
Soft steel bars	3.00c.
Reinforcing bars	2.60c.
Cold-fin. flats and sq.	3.55c.
Round and hex.	3.55c.
Cold-rolled strip steel	3.10c.
Hot-rolled annealed sheets (No. 24)	4.05c.
Heavy hot-rolled sheets, 3/16 in., 24 to 48 in. wide	3.62c.
Galv. sheets (No. 24)	4.70c.
Bands	3.42c.
Hoops	3.42c.
Hot-rolled unannealed sheets	3.17c.
Com. wire nails, base per keg	$3.25
Black wire, base per 100 lb.	3.55c.

BOSTON

	Per Lb.
Beams, channels, angles, tees, zees	3.52c.
H beams and shapes	3.52c.*
Plates—sheared, tank and univ. mill, ¼ in. thick and heavier	3.52c.*
Floor plates, diamond pattern	5.33c.
Bar and bar shapes (mild steel)	3.30c.
Bands 3/16 in. thick and No. 12 ga. incl.	3.60c. to 4.60c.
Half rounds, half ovals, ovals and bevels	4.55c.
Tire steel	4.55c.
Cold-finished rounds and hexagons	5.25c.*
Cold-rolled strip steel	3.345c.
Cold-finished squares and flats	5.75c.
Blue annealed sheets, No. 10 gal.	3.60c.
One pass cold-rolled sheets No. 24 ga.	4.15c.
Galvanized steel sheets, No. 24 ga.	4.85c.
Lead coated sheets, No. 24 ga.	5.80c.

Prices delivered by truck in metropolitan Boston, subject to quantity differentials.

*Base.

PACIFIC COAST

	Base per Lb.			
	San Francisco	Los Angeles	Seattle	
Plates, tank and U. M.	3.55c.	3.70c.	3.55c.	
Shapes, standard	3.55c.	3.70c.	3.55c.	
Soft steel bars	3.60c.	3.70c.	3.60c.	
Reinforcing bars	3.50c.	3.50c.	3.50c.	
Hot-rolled annealed sheets (No. 24)	4.40c.	4.45c.	4.40c.	
Hot-rolled sheets (No. 10)	3.75c.	3.80c.	3.75c.	
Galv. sheets (No. 24)	5.00c.	5.05c.	5.00c.	
Cold finished steel:				
Rounds	5.95c.	5.95c.	4.75c.	
Squares and hexagons	7.20c.	7.20c.	6.00c.	
Flats	7.70c.	7.70c.	7.00c.	
Common wire nails—base per keg				
less carload	$3.40	$3.25	$3.30	

All items subject to differentials for quantity.

Army to Buy Machine Tools Costing $2,300,000

WASHINGTON, Nov. 13.—Totaling approximately $2,300,000, including cost of installation, the ordnance bureau, War Department, has issued an extensive list of machine tools for which it will receive bids Nov. 19 and 20 and Dec. 3 and 4. The equipment is to be purchased with PWA funds and is to be installed at arsenals and field service stations. The largest group on the list consists of about 98 lathes of different kinds to cost about $486,272. The number may be reduced to 88.

Other groups, also subject to revision, include 93 milling machines, $323,100; boring machines, $293,200; screw machines, $115,050; three broaching machines, $10,600; 66 drill presses, $75,290; 19 planers, shapers and slotters, $50,050; 31 turret lathes (in addition to lathes already mentioned), $154,300; eight gear cutting machines, $57,000; electrical equipment, $11,980; woodworking machinery, $40,960; 26 bench lathes, $29,900; 14 thread cutting machines, $45,900; 112 grinders, $157,045; welding equipment, $10,900; testing machines and laboratory equipment, $23,085; 37 small tools, $8,879; furnaces and furnace equipment, $94,400; 46 metal working machines, $124,000; miscellaneous equipment, $180,611.

Aircraft Production Rises Slightly

AIRPLANES manufactured in the United States during the first nine months of 1934 totaled 1285, of which 673 were for domestic civil use, according to a survey by the Bureau of Air Commerce, Department of Commerce. This represented a total increase of 220 aircraft over the corresponding period in 1933.

The 673 airplanes built for civil use in this country during the period Jan. 1 to Sept. 30 included 518 monoplanes and 155 biplanes. Of the monoplanes 213 were open cockpit and 305 were cabin types. The biplanes included 45 open cockpit and 110 cabin craft.

Copper Buying Improves Gradually As European Situation Remains Unsettled

Lead Prices Decline Further, While Spelter Continues Fairly Steady At Recent Low Level—Tin Slightly More Active

NEW YORK, Nov. 13.—Although sales of copper in this market seem to be gradually improving, the European situation remains unsettled and no semblance of a buying movement can be noticed. The Blue Eagle price remains unchanged at 9c. a lb., delivered Connecticut Valley, and there is no reason to believe that the code authority contemplates any change. Fluctuations in the foreign market have been less pronounced during the past week, and the London price this morning ranges from 6.85c. to 6.90c., usual Continental base ports. Sales of copper in the domestic market last week approached 1000 tons on one or two days and may average close to that figure in the current period.

Zinc

Despite a further decline in the ore market on Saturday, quotations on spelter are still holding at the low levels established last week. Prime Western is quotable at 3.75c. a lb., East St. Louis, and 4.10c., New York, but even these figures are not attracting much business. Last week's sales were not heavy and producers are resisting to some extent the efforts of consumers to cover into the first of the year. Some metal, however, has been bought for this period. The last decline in concentrates brought the price down to $23 and $24 a ton, respectively, for the flotation and mill grades. Production amounted to 8000 tons and sales to 2300 tons, but curtailment is now effective and not more than 1500 tons is expected to be turned out this week. A slight pick-up in the galvanizing trade may boost zinc consumption slightly before the end of the year. The producers' committee of the American Zinc Institute reports sales of 6335 tons of Prime Western during October for delivery in that month at an average weighted price of 3.835c. a lb., and of 12,215 tons for subsequent delivery at a weighted average of 3.833c. a lb.

Tin

The market in this country has been somewhat more active since the election, although business abroad continues rather dull. Tin plate makers in the United States are still believed to have rather large stocks and with mill operations down to 35 per cent, there is little indication that their taking will increase materially over the remainder of the year. Price fluctuations have been of a minor character, and the market this morning is quotable at 51.35c. a lb. At London, spots standard is quotable today at £228 7s. 6d., futures at £228 10s., and Straits metal at Singapore at £230.

Lead

Prices were reduced another five points in the middle of last week and the market remains quotable at 3.45c. and 3.60c. a lb., respectively, St. Louis and New York. The price decline brought out little new buying and sellers expect the market to remain rather dull through this week. Consumers ordinarily do not enter the market in a large way before the twentieth of the month and the December position is still largely unsold. A little metal is yet to be bought for November delivery and a few carload lot inquiries are before the trade. Consumption of lead is still believed to be comparatively satisfactory, although a seasonally dull period is at hand.

Ingot Brass and Bronze

The combined September deliveries of ingot brass and bronze made by members of the Non-Ferrous Ingot Metal Institute amounted to 3260 net tons, compared with 3757 tons in August.

The Budd Wheel Co., Philadelphia, in the first nine months of 1934, had a profit of $116,129, compared with a loss of $262,775 in the first nine months of 1933. The company reports a net loss for the third quarter of 1934, after deducting all charges, including depreciation, interest and taxes of $32,480. This compares with a profit of $89,431 in the second quarter of 1934 and a profit of $24,307 in the third quarter of 1933.

The Week's Prices. Cents Per Pound for Early Delivery

	Nov. 8	Nov. 9	Nov. 10	Nov. 12	Nov. 13
Electrolytic copper, N. Y.*	8.75	8.75	8.75	8.75	8.75
Lake copper, N. Y.	9.12½	9.12½	9.12½	9.12½	9.12½
Straits tin, Spot, New York	51.35	51.40	....	....	51.35
Zinc, East St. Louis	3.75	3.75	3.75	3.75	3.75
Zinc, New York	4.10	4.10	4.10	4.10	4.10
Lead, St. Louis	3.45	3.45	3.45	3.45	3.45
Lead, New York	3.60	3.60	3.60	3.60	3.60

*Refinery quotations; price ¼c. higher delivered in Connecticut.

Aluminum, virgin 99 per cent plus, 19c. to 22c. a lb., delivered.
Aluminum, remelt No. 12 (alloy), carload lots delivered, 14c. a lb., average for week.
Nickel electrolytic cathode, 35c. a lb., delivered; shot and ingot, 36c. a lb., delivered.
Antimony, 10.50c. a lb., New York.
Brass ingots, 85-5-5-5, 8.25c. a lb., New York and Philadelphia.

From New York Warehouse

Delivered Prices, Base per Lb.

Tin, Straits pig	52.50c. to 53.50c.
Tin, bar	54.50c. to 55.50c.
Copper, Lake	10.25c. to 11.00c.
Copper, electrolytic	10.00c. to 10.50c.
Copper, castings	9.75c. to 10.75c.
*Copper sheets, hot-rolled	16.00c.
*High brass sheets	14.50c.
*Seamless brass tubes	16.00c.
6Seamless copper tubes	16.25c.
*Brass rods	13.00c.
Zinc, slabs	5.75c. to 6.75c.
Zinc, sheets (No. 9), casks, 1200 lb. and over	10.25c.
Lead, American pig	4.50c. to 5.50c.
Lead, bar	5.50c. to 6.50c.
Lead, sheets	7.50c.
Antimony, Asiatic	13.50c.
Alum., virgin, 99 per cent, plus	23.30c.
Alum., No. 1 for remelting, 98 to 99 per cent	18.00c. to 19.00c.
Solder, ½ and ½	32.00c. to 33.00c.
Babbitt metal, commercial grades	25.00c. to 60.00c.

*These prices are also for delivery from Chicago and Cleveland warehouses.

From Cleveland Warehouse

Delivered Prices per Lb.

Tin, Straits pig	55.50c.
Tin, bar	57.50c.
Copper, Lake	10.00c.
Copper, electrolytic	10.00c.
Copper, castings	9.75c.
Zinc, slab	5.75c. to 6.00c.
Lead, American pig	4.65c. to 4.90c.
Lead, bar	7.75c.
Antimony, Asiatic	9.00c.
Babbitt metal, medium grade	18.50c.
Babbitt metal, high grade	59.50c.
Solder, ½ and ½	33.25c.

Old Metals, Per Lb., New York

Buying prices are paid by dealers for miscellaneous lots from smaller accumulators, and selling prices are those charged to consumers after the metal has been prepared for their uses. (All prices are nominal.)

	Dealers' Buying Prices	Dealers' Selling Prices
Copper, hvy. crucible	5.50c.	6.25c.
Copper, hvy. and wire	5.37½c.	5.87½c.
Copper, light and bottoms	4.37½c.	4.87½c.
Brass, heavy	2.87½c.	3.50c.
Brass, light	2.12½c.	2.87½c.
Hvy. machine composition	4.12½c.	4.75c.
No. 1 yel. brass turnings	4.12½c.	4.75c.
No. 1 red brass or compos. turnings	3.87½c.	4.37½c.
Lead, heavy	2.75c.	3.12½c.
Zinc	2.00c.	2.37½c.
Cast aluminum	9.62½c.	10.75c.
Sheet aluminum	11.00c.	12.50c.

Railroad Equipment

Pennsylvania Railroad has ordered 57 streamlined electric locomotives. Eighteen complete locomotives will be built at railroad's Altoona, Pa., shops, which will also supply electric propulsion and control apparatus for chassis of 25 additional engines. The 25 chassis will be built at Eddystone, Pa., works of Baldwin Locomotive Works. General Electric Co. will construct 14 complete locomotives and electrical propulsion and control apparatus for nine additional engines. Westinghouse Electric & Mfg. Co. will build electric propulsion and control apparatus for 34 locomotives.

Denver & Rio Grande Western is inquiring for four dining cars.

Mesta Machine Co., Homestead, Pa., has purchased two flat cars and two gondola cars from Standard Steel Car Corpn.

Norfolk & Western Railroad has purchased 3800 tons of tie plates from Bethlehem Steel Co., Carnegie Steel Co., Weirton Steel Co., and Wheeling Steel Corpn.

Contracting Officer, office of Chief of Engineers, Munitions Building, Washington, asks bids until Dec. 3 for three to six 8-ton gasoline-mechanical drive locomotives (Circular 14).

Pipe Lines

San Diego, Cal., plans six miles of 48-in. in connection with El Capitan-Lakeside pipe line for trunk water supply, and will ask alternate bids for welded steel, cast iron and concrete pipe. Cost about $350,000. Fred D. Pyle, city hydraulic engineer, is in charge.

United States Engineer Office, Post Office Building, Savannah, Ga., asks bids until Nov. 19 for six sections steel suction pipe, castings, two sections discharge pipe and four sections ladder pipe (Circular 75).

Willacy County Water Control and Improvement District No. 1, Raymondville, Tex., C. S. Clark, clerk, plans 170 miles high-pressure 5 to 12-in. welded steel, coal tar coated, and about 150 miles low-pressure 10 to 24-in. welded steel in connection with irrigation and water supply project in parts of Willacy and Hidalgo counties. Alternate bids will be asked for reinforced-concrete, California redwood and creosoted Douglas fir pipe. Fund of $4,853,000 has been secured through Federal aid for development, including 12 electric-operated pumping plants, main central generating station of 2500 hp. rating, transmission and distributing lines for electrical service.

La Mesa, Spring Valley & Lemon Grove Irrigation District, La Mesa, Cal., closes bids Nov. 17 for 4500 ft. 24-in. welded steel pipe for main trunk water line; 2870 ft. of 6 and 8-in. welded steel pipe for distribution system. C. Harritt is general manager and chief engineer.

Houston, Tex., closes bids Nov. 21 for extensions and replacements in gas distribution system, Magnolia Park district, including pipe lines. Financing has been secured through Federal aid.

Upland, Cal., has awarded 7920 ft. of 10-in welded steel pipe to Southern Pipe & Casing Co. in open market.

Cast Iron Pipe

Monterey, Tenn., asks bids until Nov. 22 for pipe for waterworks system, including pumping machinery and other equipment. J. B. McCrary Corpn., Atlanta, Ga., is consulting engineer.

International Falls, Minn., plans about four and a half miles of 20-in. for trunk line from Rainy Lake and smaller pipe for distribution. Bond issue of $170,000 has been authorized for this and other waterworks development, including pumping plant, water tower, chlorinator, etc. Toltz, King & Day, Inc., Pioneer Building, St. Paul, is consulting engineer.

Olney, Tex., will soon ask bids for water system, including 200,000-gal. elevated steel tank on 75-ft. tower, pumping plant, etc. Fund of $135,000 has been arranged through Federal aid. Montgomery & Ward, Harvey-Snider Building, Wichita Falls, Tex., are consulting engineers.

Wingo, Ky., plans water pipe lines. Fund of $36,000 has been secured through Federal aid for this and other waterworks equipment, including elevated steel tank and tower, and pumping station.

Toccoa, Ga., plans water pipe lines. Cost about $50,000 with other waterworks equipment. Robert & Co., Bona Allen Building, Atlanta, Ga., are consulting engineers.

Rochester, Minn., plans extensions in water pipe system, including replacement of present small sections with larger pipe. Cost about $80,000. Proposed to carry out work early in 1935.

Wells, Tex., closes bids Nov. 26 for extensions and improvements in water pipe lines, including elevated tank and tower, pumping machinery, etc. Joseph Rady, Majestic Building, Fort Worth, Tex., is consulting engineer.

Middle Point, Ohio, plans water pipe system; also pumping station and 100,000-gal. elevated storage tank on 100-ft. tower. Cost about $36,000. C. J. Simon, Van Wert, Ohio, is consulting engineer.

Spruce Pine, N. C., closed bids Nov. 15 for 10,200 ft. of 6 and 8-in. for water system.

Secretary, Md., plans water pipe lines; also new pumping station and elevated storage tank. Cost about $21,000. J. R. Cronister, Hyattsville, Md., is consulting engineer.

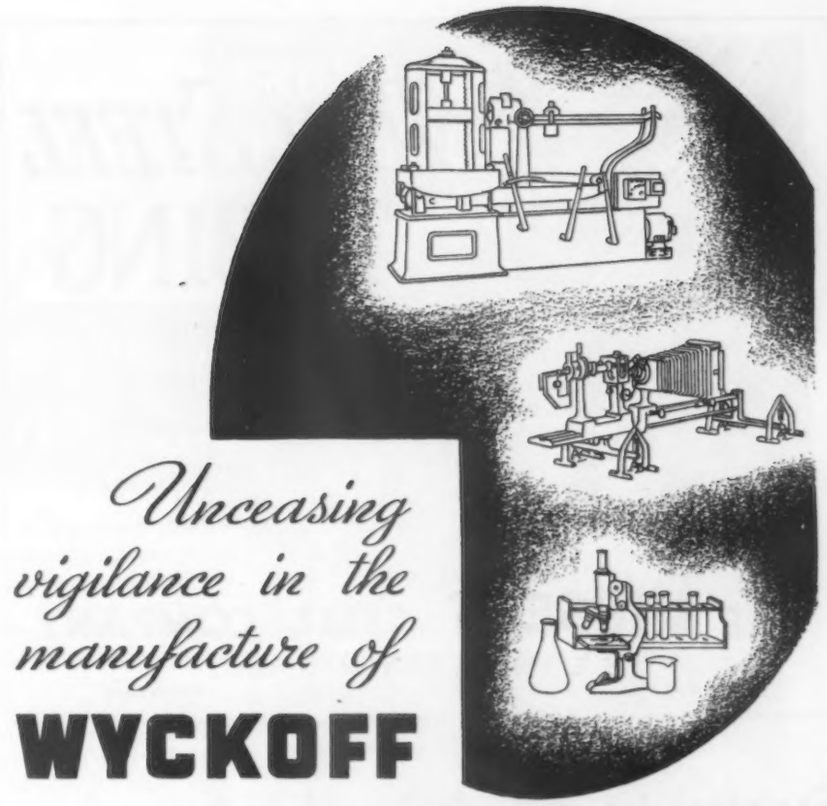
Township of Milwaukee, Wis., has rejected bids for 3476 lin. ft. of 8 and 16-in. water mains opened Nov. 1 and will not readvertise until spring.

Madison, Wis., closes bids Nov. 20 on 3854 lin. ft. of 12-in. for discharge line.

Watertown, Wis., has placed 5200 ft. of 6-in with James B. Clow & Sons.

Benld, Ill., has awarded 1000 tons to United States Pipe & Foundry Co.

Brawley, Cal., has awarded 950 tons to United States Pipe & Foundry Co. through a general contractor.



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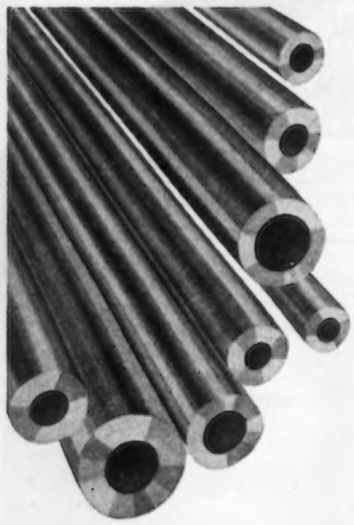

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Stainless Steel and Porcelain Enamel Sheets Used in Standard Service Station

THE trend toward attractiveness in gas service stations seems fully as marked as the tendency toward streamlining in the automotive and in the railroad passenger coach field. The gas station of the more common models of a few years ago, sturdy in construction, but lacking in beauty and refinements, is passing out of the picture. The station covered with corrugated steel and other common models of yesterday served their purposes efficiently, but modern merchandising methods demand something more attractive. For the same reason that retail merchants lately have been modernizing their store fronts and display windows, gasoline distributers are improving the appearance of their stations, which, with servicing facilities and their lines of accessories, have long since passed the stage of being only filling stations.

Brightness and color are outstanding characteristics of gasoline stations of more modern types, features that always are appealing in the daytime and perhaps even more so under the blaze of night illumination. Neatness and cleanliness are other important factors.

Developments in the steel making and the allied industries of coating metals have made possible the transformation of the gas station. An outstanding innovation in these stations is found in a design recently developed by the Standard Oil Co. of Ohio which has been adopted as a standard for all its future stations. In the construction of these stations stainless steel is used in liberal quantities for exterior covering, decorative effects and trimming. Another important feature of the design is that porcelain enameled sheets are used probably to a much larger extent than ever before in a gasoline station. Excepting the steel roof, practically the entire surface of the building, including the inside finishing, is of stainless steel, porcelain enameled steel and glass. Another innovation in the design of these stations is that they are so constructed that they can be completely taken down and re-erected in another location. Eighteen of these standard stations have been built or are under construction in Ohio and the same design will be followed in building new and replacing old stations.

Following the red, white and blue color scheme of the company the stations have a wide strip of white enamel extending around the building above the window space and above that is a narrow strip of red enamel. Between and along the outer edges of these strips of enameled panels are bands of stainless steel. At the lower part of the building between the windows and concrete foundations is a strip of blue enamel trimmed with stainless steel. The trim around the windows, the door frames and the doors themselves are of stainless steel. The color scheme of the enamel, together with the bright finish of the stainless steel, combine to make service stations that are both artistic and attractive in appearance and easy to keep immaculately clean both inside and out.

The stations are built in two standard models, one designated as the lubratorium, having on one side facilities including two racks for greasing and oil changing inside the station, entrance to which is through two overhead stainless steel doors. The other section is the gasoline attendant's room for servicing gas and for merchandising oil and other products, and includes a railing-inclosed waiting room equipped with easy chairs. The other type is of the same general

design, but is only a gas and oil service station without accommodations for changing oil and grease.

The frame is of structural steel, with its members bolted together to permit the structure being taken down. The porcelain enameled covering is made of sections or pans, the largest being about 3 ft. square. The four edges are turned back ¾ in. When erected, these edges are clamped together and the pans are clamped to the frame, being held by battens on the inside. The stainless steel bands are anchored to the steel frame by self-tapping screws. A calking compound is applied to the porcelain enamel joints. The interior trim of the gas service attendant's room is of stainless steel and the walls and ceiling are entirely covered with porcelain enameled panels held in place with screws.

The company's name is shown in red porcelain enamel letters in the white enamel panels. In case the name is to be illuminated, Neon tubes are superimposed over the letters and the electrodes extend through holes in the panel.

In the construction of these stations Enduro stainless steel sheets of 20 gage are used. The porcelain enamel surfaces are made of 18-gage sheets. For building one of the lubratorium types of stations 1 ton of stainless steel is used, about 4½ tons of enamel sheets and 7 tons of fabricated shapes. The total amount of steel used in the construction of the larger unit, including the steel roof deck, is between 12 and 14 tons.

Valley Engineering Group Visits Mathews Plant

MORE than 200 industrial plant engineers attended a meeting and plant visitation sponsored by the Mahoning-Shenango Valley Egineers' Society which was held recently at Ellwood City, Pa. After an inspection of the plant of the Mathews Conveyor Co., Ellwood City, at which F. E. Moore, president of the company, acted as host, the group met at the Ellwood Country Club for dinner and technical discussion.

After formal greetings by Mr. Moore, J. W. Offutt, general manager, Shelby works, National Tube Co., Ellwood City, and W. Keith McAfee, president, American Ceramic Society, Nels Davis, Pittsburgh district manager, Link-Belt Co., spoke on the "Recent Development and Improvement of Bulk Materials Handling Equipment," and M. J. Anderson, chief engineer, Mathews Conveyor Co., discussed "Factory Transportation."

The Mahoning-Shenango Valley group has voted to allow its executive council to consider affiliation with the American Society of Mechanical Engineers.

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Awards 1555 Tons—New Projects 3035 Tons

Columbia County, N. Y., 150 tons, mesh for highway, to American Steel & Wire Co.

Covington, Ky., 520 tons, highway bridge, to Truscon Steel Co.

Buffalo, 100 tons, Kensington high school, billet grade, to a Buffalo bidder.

Buffalo, 200 tons, Kensington high school, rail bars, to Concrete Steel Co.

Compton, Cal., 350 tons, Compton junior college administration building, to Soule Steel Co.

State of California, 130 tons, highway work in five counties, to unnamed bidders.

Fremont County, Colo., 104 tons State highway structure, to an unnamed bidder.

NEW REINFORCING BAR PROJECTS

Richmond, Va., unstated tonnage, parcel post building.

Atlanta, Ga., 800 tons, State penitentiary.

Springfield, Ill., 200 tons, waterworks.

State of Indiana, 250 tons, bridges; bids Nov. 20.

Des Moines, Iowa, 150 tons, post office; plans being refigured.

Waterloo, Iowa, 200 tons, addition to packing plant.

East St. Louis, Ill., 1200 tons, diversion of Cahokia Creek; G. Locke Tarlton, St. Louis, low bidder on general contract.

Long Beach, Cal., 121 tons, arts and science building at Jefferson high school; bids soon.

France Field, Canal Zone, 116 tons, noncommissioned officers building, bids Nov. 30.

Dictated Economies; Yesterday, Today and Tomorrow

(Concluded from Page 23)

late production, and interfering only to remove import duties, punish fraud and relieve want among the poorest, and had encouraged personal economy by counsel, exhortation and example, the food problem would have solved itself in a much more effective and advantageous way. It would seem that State 'Kontrolle,' in matters economic, requires for its successful prosecution not only a people with a talent for organization but rulers endowed with understanding and judgment. In the case of the German food policy systematizing and organizing ability were undoubtedly present, but directive acumen was singularly lacking. The ruling orders in Germany reveal themselves neither as gods nor demons, but as very ordinary men doing palpably stupid things with an earnestness and energy worthy of more intelligent direction."

Turning now from yesterday to today, we find a plenitude of examples of nations seeking escape from the neurosis of defeatism through the establishment of economic dictatorships. Russia is, of course, the outstanding example. In that country, personal liberty of action or of expression is unknown, a small group of dictators, shrouded in the awesome shadow of the G.P.U., holds not merely the power of life and death over every citizen, but, more important, dictation of the manner of living. Here we have regimentation perfected to its highest modern degree; an economic czarism far surpassing in its inflexibility and its power that of Nicholas II and his royal predecessors. Yet, strangely enough, in spite of the Soviet Union having become the premier example of a dictated economy, we do not find our Tugwells and other "planned economy" disciples hastening to renounce their American citizenship and enlisting under a banner where what they advocate has already been achieved.

Italy was one of the first countries, since the war, to resort to a "planned economy." As a result of it, there is one planner and one government. Both are Il Duce. Planned economy, in Italy, has spelt the complete abolition of freedom of speech, of the right of assembly and petition and the effectual muzzling of the press. Col. Frank Knox, editor of the Chicago *Daily News*, has graphically described the situation as follows:

> What is the score of a dozen years of Fascism in Italy?
>
> The public debt has mounted this year to the staggering total of 102,000,000,000 lire, according to Government statistics. [At current exchange, the lira is worth 8.53 cents in American money, or about 11.7 to the dollar.] But to this must be added another 50,000,000,000 lire of debts not included in the Government's figures. Thus, the total debt of Italy today is over 150,000,000,000 lire, or about $13,000,000,000. Five years ago it was 111,000,000,000 lire, or about $9,500,000,000.
>
> The budget for governmental expenses in 1928 showed a surplus of income over expenses of 555,000,000 lire. The budget for 1933 showed a *deficit* of 3,663,000,000 lire.
>
> Both the debt and the budget figures disclose a disquieting tendency toward ultimate national bankruptcy.
>
> Last year taxes in Italy consumed approximately 38 per cent of the total national income. This is far beyond the danger line. It spells disaster unless taxes are sharply reduced.
>
> And what has managed economy done for employment? In January, 1930, there were approximately 500,000 unemployed. But in January, 1934, there were more than 1,150,000 out of work.

Germany, under Hitler, has become an exponent of "planned economy," which is another word for economic dictatorship. As Il Duce is the Government in Italy, so Hitler is the supreme ruler in Germany today. Not only the ruler in things political and economic but, beyond these, ruler of religion, of thought and of expression. For economic dictatorship knows no bounds; once the virus infects even a little finger of the body politic, it spreads throughout the whole body, enslaving not merely the physical but the mental and spiritual as well. Regimentation is unable to go part way; it is whole hog or none as experience has so clearly indicated in the pages of ancient and modern history.

What will be the future of planned economy? That is best answered by revealing its past. The end of the tale of modern nations which are now worshiping this false god is not yet written. But what grounds have we for believing that in these cases, as in so many others, history will not repeat itself? Thank God that in America, at least, we seem to be now turning away from the siren song of those visionaries who would have us trade our heritage of initiative and independence for a pedagogic and poisonous mess of socialistic pottage.

In the words of Woodrow Wilson, and they are words to which all Americans who hope for better things tomorrow can subscribe:

> "I do not want to live under a philanthropy. I do not want to be taken care of by the Government either directly or by any instruments through which the Government is acting. I want only to have right and justice prevail so far as I am concerned. Give me right and justice and I will undertake to take care of myself. I will not live under trustees if I can help it. I do not care how wise, how patriotic, the trustees may be. I have never heard of any group of men in whose hands I am willing to lodge the liberties of America in trust."

German Exports Continue Heavy—Poland May Join Rail Makers' Cartel

HAMBURG, Nov. 5 (*By Special Correspondence*).—The German steel export market continues to show an activity which is between 30 and 40 per cent better than last year. Japan has placed a few large orders for reconstruction of the devastated area around Osaka and will place 100,000 tons in which the German industry will share. Most of the business is for prompt shipment with the usual extra paid for such shipments. Barter contracts are numerous this week, with Manchukuo and India represented.

Further Improvement in Machinery

The German machinery industry reports a further improvement in business and is operating at approximately 61.2 per cent of capacity, compared with 60.7 per cent at the end of September and 59.2 per cent one month before. The export business is also slowly improving. In October, 1933, the Germany machinery industry operated at 48.3 per cent. Russian business is not yet showing signs of an improvement, but, according to a report of the German Federation of Machinery Makers, $30,000,000 worth of machine tools and metal working machines must be bought unless Russia's industrial program is to severely suffer.

It is possible that Poland at last will enter the International Rail Makers' Association. This group, of which the United States steel industry forms a part, has suffered much from Polish competition. Now the Polish industry has signed a barter agreement with Germany covering the exchange of 2000 tons of steel rails monthly against German steel castings and other steel products not produced in Poland. The 2000 tons will be taken up by the German steel cartel for sale in Germany. This agreement is reported to be the first step towards an agreement by which Poland would enter the steel cartel.

Soldering-Over of Auto Body Welds

(Concluded from Page 14)

whether or not it would be advisable to weld bodies at a lower production rate by means of the arc welding process. One company has, in fact, started production in this manner very successfully. Another large body plant, in Detroit, gave the same process careful consideration, but at length solved its problem in another way. They recently put into operation a large machine which welds simultaneously both back panels, both roof rail joints to the front, and both shroud joints. This unit, built by the Federal Machine & Welder Co., is one of the most interesting flash welders put in production so far, and the writer sees large possibilities ahead for machines of this type, because the six welds are made simultaneously in almost the same time as the usual standard flash welder takes to weld only the back panel. But even more important is the large saving in floor space and in work handling.

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OBITUARY

WILLIAM L. CLEMENTS, who retired in 1925 as president of the Industrial Works, now the Industrial Brownhoist Corpn., Bay City, Mich., died at his home Nov. 6, aged 74 years. He served for more than 20 years in various capacities with the Industrial Works. He was a regent of the University of Michigan for a quarter of a century and erected on the campus at Ann Arbor the Clements Memorial Library, presenting his collection of valuable books and manuscripts to the library in 1922.

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E. H. SANITER, inventor of the iron and steel desulphurization process bearing his name, and a Bessemer medallist, died on Nov. 2, aged 71 years.

❖ ❖ ❖

ERNEST COVENTRY, senior partner of Sim & Coventry, Liverpool, England, tin plate merchants, and chairman of the board of the Redbrook Tin Plate Co., died Nov. 10, aged 74 years.

❖ ❖ ❖

JOHN A. MCFADYEN, sales manager of the J. M. Nash Co., Milwaukee, manufacturer of woodworking machinery, was fatally injured with a companion on Nov. 8 in a train collision while traveling to northern Wisconsin on a hunting expedition. He was 49 years old.

W. K. HUGHES, former chairman of the board and president of Continental Supply Co., oil well supplies, died of pneumonia at a hospital in St. Louis recently. He was born in Pittsburgh 58 years ago. He went to St. Louis as president of the Continental company in 1909, when it was founded by the Youngstown Sheet & Tube Co. In 1930, he was appointed chairman of the board, resigning from the firm two years later to devote his time to personal affairs.

❖ ❖ ❖

EARLE G. BOTT, vice-president and general manager, Blackhawk Mfg. Co., Milwaukee, manufacturer of wrenches and other mechanics' tools, died Nov. 2, aged 40 years. He had been ill three months. Mr. Bott was born in Cincinnati, going to Milwaukee in 1917. He joined the Blackhawk company in a minor capacity in 1920.

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RALPH M. DRAVO, president of Dravo Contracting Co. and chairman of the board of Dravo Corpn., Pittsburgh, died at his Sewickley Heights, Pa., home on Nov. 11, aged 66 years. Soon after being graduated from Lehigh University in 1889 he joined the Illinois Steel Co. at South Chicago, later going to the Carnegie Steel Co., Edgar Thomson plant at Braddock, Pa. He subsequently joined his brother, F. R. Dravo, who was killed in February of this year, in founding the F. R. Dravo & Co., which later became Dravo Contracting Co. During the world war he was Chief of Ordnance at Pittsburgh for the United States Army and at the conclusion of the war became a member of the War Settlement Contract Adjustment Board. He was awarded the distinguished service medal for his service. He was a director of many companies including Davison Coke & Iron Co. and Dravo Doyle Co.

British Stainless Steel Merger Soon Operative

THE arrangement entered into some few months ago for the amalgamation of the stainless steel interests at Sheffield of Thomas Firth & John Brown, Ltd., will be shortly carried into effect by the registration of a new company to be entitled Firth-Vickers Stainless Steels, Ltd. Sanction by the debenture-holders of Thomas Firth & John Brown, Ltd., of the financial arrangements involved is to be sought at a meeting to be held in the near future.

The new enterprise will operate plants which have been very considerably increased since the fusion was decided upon; it is estimated that the facilities of production of stainless steel and its manipulation into sheets have been increased by about 50 per cent at the two works since the amalgamation was proposed. The extended facilities were ready for operation at the beginning of November.

American Metal Co., formerly of Arlington, N. J., has moved to 247 Verona Avenue, Newark, N. J.

PLANT EXPANSION AND EQUIPMENT BUYING

Ford Buys $1,000,000 Worth of Machine Tools and Equipment

DETROIT, Nov. 13.—Carrying out its program for expansion of productive capacity at the Rouge plant, the Ford Motor Co., during the past ten days, has placed orders for over $1,000,000 worth of equipment of which about $750,000 is for machine tools and about $300,000 for foundry equipment. Purchases are reported to have included approximately $275,000 for grinding machinery for work on the camshaft, crankshaft and other parts.

One order for automatic equipment totaling $250,000 is understood to have gone to a Connecticut builder. Some of the business also has been distributed among machine tool companies at Rockford, Ill., Cleveland and Cincinnati. Despite the fact that these expenditures by Ford constitute one of the largest transactions this year, in the machine tool market, it is estimated that well over $1,000,000 worth of equipment is yet to be bought at Dearborn. Most of these orders are expected to be allotted in the next week.

Ford is reported to be asking that the new machinery be delivered to the Rouge plant during January.

Packard has ordered a few additional machines including tools for machining transmission gears. The machine tool trade in Detroit has quotations out on a large amount of equipment, a considerable part of which should be closed before the end of the year.

NEW ENGLAND

Crane Co., 836 South Michigan Avenue, Chicago, manufacturer of valves and engineering specialties, has let general contract to Googins & Clark, 46 Portland Street, Portland, Me., for rebuilding factory branch, storage and distributing plant at Portland, recently damaged by fire. Webster & Libby, 443 Congress Street, Portland, are architects.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Nov. 23 for lubricating oil pumps and spare parts for Portsmouth, N. H., and Mare Island yards (Schedule 3698).

Reliance Products, Inc., Holyoke, Mass., has been organized by Kenneth C. Gosling, 39 Laurel Street, and associates to manufacture windshield heaters and other automotive specialties.

Narragansett Brewing Co., Arlington district, Cranston, R. I., will soon take bids on general contract for two-story and basement addition, primarily for a mechanical bottling works. Cost about $45,000 with machinery. E. M. Corbett, 49 Purchase Street, Fall River, Mass., is architect.

General Automotive Products Co., Boston, has been organized by Willard W. Rice, 106 Sumner Street, Newton Centre, Mass., and associates, to manufacture automobile equipment.

NORTH ATLANTIC

Mathieson Alkali Works, Inc., 250 Park Avenue, New York, has revised plans for several units of new plant now in course of construction at Lake Charles, La., including capacity in lime division, with larger rotary kiln and other machinery, and change from natural gas to oil operation. Entire plant will now cost approximately $8,000,000 with machinery, instead of smaller sum previously noted. E. A. Hultz is vice-president and manager of operations.

Atwood Multiple Writer, Inc., New York, care of Miller, Murray & Co., 114 East Thirty-second Street, representatives, recently organized, plans establishment of new plant for manufacture of typewriter devices and parts. Company is arranging financing to total $432,500, part of fund to be used for purpose noted.

Erickson & Remmert, Inc., Brooklyn, has been organized by Edward L. Erickson and William Warner, Floyd Bennett Airport, Brooklyn, to manufacture airplanes and parts.

Superintendent of Lighthouses, St. George, Staten Island, N. Y., asks bids until Nov. 22 for 190 cast iron sinkers and ballast balls, each with forging cast in, weight from 120 to 8500 lb., estimated total weight, 579,490 lb. (Proposal 47396.)

Metal Package Corpn., 110 East Forty-second Street, New York, manufacturer of metal boxes, cans and other containers, plans extensions and improvements in branch plant at 346 Carroll Street, Brooklyn. Cost over $60,000 with equipment.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Nov. 20 for four secondary drainage pumps and spare parts (Schedule 3713), medium flat bar steel and flat strip steel, black and galvanized (Schedule 3714) for Brooklyn and Philadelphia Navy Yards.

Mine Tubing & Specialty Co., Inc., Brooklyn, has been organized by John B. Bennett, 274 St. Johns Place, and associates, to manufacture metal tubing for mining, and other mining equipment.

Signal Supply Officer, Army Base, Brooklyn, asks bids until Nov. 19 for 164 relays (Circular 46); until Nov. 20, six high-speed automatic keying heads, six keying head drivers, 15 tape pullers, 15 tape rewinders, five tape reels and five tape recorders (Circular 45).

Roosevelt Coal Corpn., 215 Forty-third Street, Brooklyn, has let general contract to Nicholson Co., 405 Lexington Avenue, New York, for new coal pocket, with conveying, loading and other equipment. Cost about $35,000.

Vacu-Spray Mfg. Co., Inc., Hackensack, N. J., has been organized by Anthony Zollino and Guy Tobler, 143 Summit Avenue, to manufacture spraying devices and equipment, beverage dispensing machinery and parts.

Hoffmann La Roche, Inc., Kingsland Road, Nutley, N. J., manufacturer of industrial and other chemicals, has let general contract to John W. Ferguson & Co., Inc., Paterson, N. J., for one-story additions, comprising five factory units and storage and distribution building. Cost about $90,000 with equipment.

State Purchase Commissioner, State House, Trenton, N. J., asks bids until Nov. 19 for corrugated iron pipe and grader blades.

Somerville Iron Works, Somerville, N. J., manufacturer of cast iron pipe, ornamental iron products, etc., has secured loan of $400,000 from RFC, to be used for operations. Branch plant at Chattanooga, Tenn., heretofore on curtailed schedule, will resume full production soon.

BUFFALO DISTRICT

Eastman Kodak Co., Rochester, N. Y., has let general contract to Ridge Construction Co., Rochester, for one-story and basement addition to Factory 201, 75 x 150 ft. Cost over $40,000 with equipment.

Leon R. Button Mfg. Co., Inc., New Berlin, N. Y., has been organized by Woolsey B. Ackerman and Leon A. Button, New Berlin, to manufacture agricultural equipment and parts.

Bennett Mfg. Co., Alden, N. Y., manufacturer of steel specialties, in equity receivership since June, 1933, is arranging reorganization and will carry out increased operations. New company will be headed by Arthur Y. Bennett, president.

SOUTH ATLANTIC

Board of Greenwood County Commissioners, Greenwood, S. C., has secured PWA loan and grant for $2,767,000 for hydroelectric power project, for which plans will soon be drawn. Generating station will be located at Buzzard's Roost on Saluda River, about 13 miles from city, and will have initial capacity of 15,000 kw., divided into three 5000-kw. units. Project will include power substations and switching stations, and transmission line 184 miles long, for service to Greenwood, Laurens and Newberry, S. C., and various rural districts. County engineering department is in charge.

City Council, Clinton, S. C., asks bids until Nov. 20 for two centrifugal pumping units, 700 and 350-gal. per min. capacity, and accessories, 30,000-gal. capacity wash water tank, pipe lines, etc., for municipal waterworks. Harwood Beebe Co., Spartanburg, S. C., is consulting engineer.

C. M. Marshall, 16 Brookhaven Drive, Atlanta, Ga., manufacturer of industrial chemicals, etc., has acquired five-story building at Fairlie and Poplar Streets, for new plant, including storage and distributing department. Cost over $20,000 with improvements and equipment.

OHIO AND INDIANA

Department of Public Service, Dover, Ohio, C. H. Krantz, director, plans addition to municipal electric light and power plant. Cost about $300,000 with equipment. Fund of that amount is being secured through Federal aid. Welda Hartline is city engineer.

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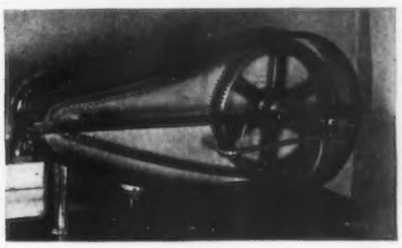
POWER TRANSMISSION NEWS

A recent order for drives for a stern-wheel river boat led to an investigation into the performance of two 115 h.p. drives installed on the river towboat *Tennessee*, in 1929. Power plant and transmission are a Diesel engine coupled to a D.C. generator, driving two 115 h.p. motors.

Both motors drive the stern wheel through two Morse Silent Chain Drives, each 12 inches wide, on 19 and 107 tooth sprockets and eight feet long between centers. Normal full load motor speed is 575 r.p.m.

The boat is now operated by the War Department, and government engineers report on this 5-year-old installation: "No troubles have been experienced. The towboat has traveled approximately 14,000 miles. . . . "and . . . if we were to design additional towboats of this type, I have no doubt that drives similar to those used on the *Tennessee* would be employed."

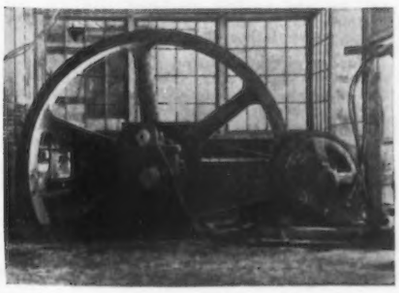


The above picture shows an exhibition drive equipped with Morse Ring Oiler, the case has a glass front.

The Morse Ring Oiler provides a continuous flow of oil upon the chain while operating. Morse chains oiled by this simple device will operate at highest efficiency and require little attention. The oil is carried from a reservoir in the bottom of the case, trapped in a cup, led through the pipe and allowed to drip on the chain, the motion of the chain splashes the oil stream sufficiently to uniformly lubricate the entire width of the chain.

Morse Speeds Up Power Change-Over

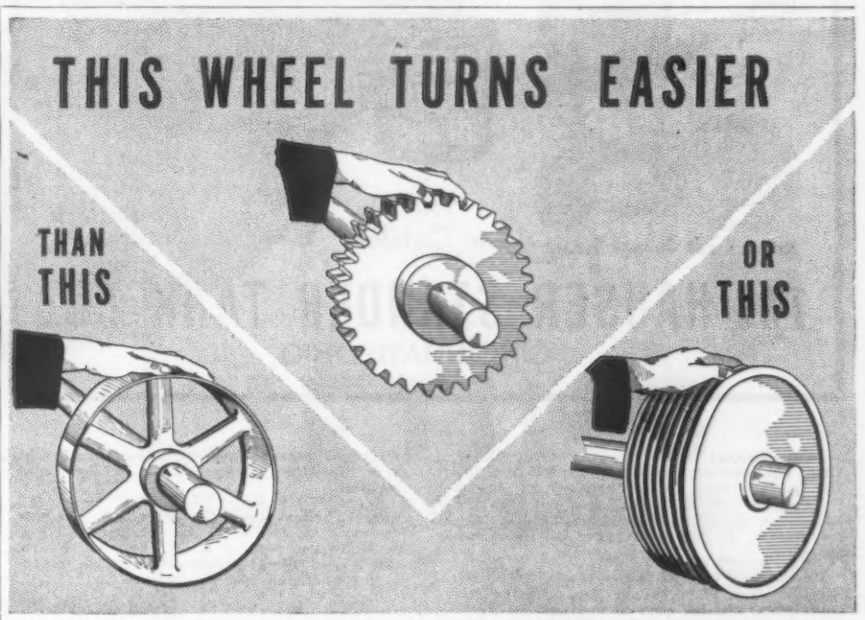
Recently a rubber mill in changing over from steam to electric power was faced with the problem of placing the transformers in the engine room, and the switchboard in the space occupied by the cylinder of the Corliss engine which was coupled to the main line shaft. Since the main line shaft had to be driven until the



power could be turned on, the situation was quite complicated.

One hundred fifty h.p. was needed by the mills on this shaft. A Morse engineer found that the only space available for a chain drive sprocket on the engine shaft was that occupied by the eccentrics. This temporary installation was going to be used for only about six months, and with the large overload capacity in a chain drive, a chain which normally would have been rated at about 100 h.p. could be safely used for this short period. This chain, 10" wide, just cleared the flywheel and the bearing stand. A motor was rented and mounted on a suitable foundation. At noon, one Saturday, the connecting rod and eccentrics were removed, a keyway cut in the shaft, and the split chain sprocket was put in place. The Morse Silent Chain was put on and the plant was ready for operation before Monday morning.

During the time necessary to complete the electric installation, the temporary motor carried the shop along, the only attention required being an occasional application of grease on the chain. The new electric drive included two 75 h.p. motors for mills and a 50 h.p. and 75 h.p. for two calenders, all with Morse Chain Drives. A 200 h.p. direct-connected, slow-speed, synchronous motor is used on another mill line shaft. When it becomes necessary to replace one of the other chains, the temporary chain can be re-assembled into the proper width and used.



TEETH—NOT TENSION
TURN
CHAIN DRIVE SHAFTS

Study the above illustration. You'll immediately see why chain drives are positive. They just can't slip. Bearing load is reduced. Chain drives deliver power with an average of 98.6% efficiency.

This high efficiency coupled with long life, low first cost, ease of installation and reduced maintenance costs means savings in production.

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MORSE CHAIN COMPANY

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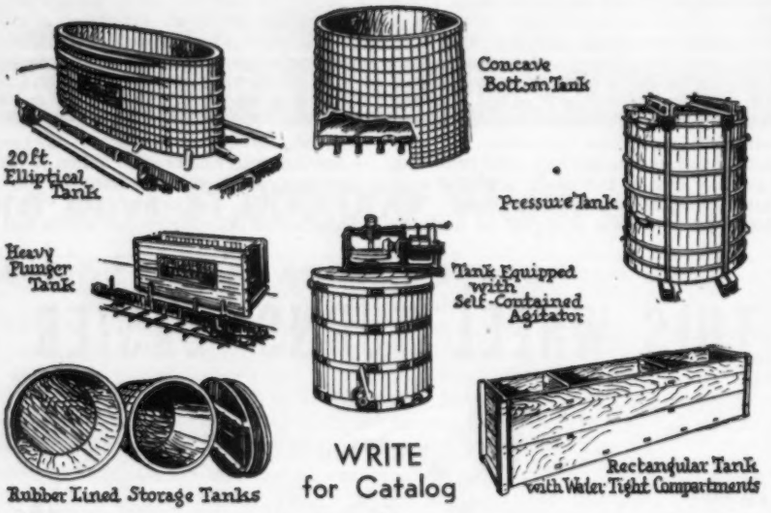
Hauser-Stander tanks serve every industry

TANKS —WOOD —RUBBER LINED
WOOD OR STEEL



Rubber Lined Storage Tanks

WRITE for Catalog

The HAUSER STANDER TANK CO.
CINCINNATI, OHIO

John Wagner Sons Brewing Co., Sidney, Ohio, has been organized with capital of $230,000 to take over former brewery of Joseph F. Wagner. Plant will be remodeled and new equipment installed. Cost over $80,000 with machinery. J. Edward Wagner will head new company.

Heekin Can Co., 435 New Street, Cincinnati, manufacturer of tin cans and other metal containers, has let general contract to Ferro Concrete Construction Co., Third and Elm Streets, for one-story addition to plant at Norwood. Cost about $45,000 with equipment.

Sectional Lawn Guard & Fence Co., Cleveland, has been organized by Mayo A. Bobrick and Frank R. Jaffe, 729 Society for Savings Building, to manufacture iron and metal specialties.

City Council, Wapakoneta, Ohio, has been authorized to arrange bond issue of $160,000 for new municipal electric light and power plant. Financing has been approved through Federal aid.

Material Division, Air Corps, Wright Field, Dayton, Ohio, asks bids until Nov. 19 for 2000 engine ring cowl tie rod strip trunnions, 600 engine ring cowl tie rods, 600 engine ring cowling valve cover cap assemblies, and 600 engine ring cowling valve cover cap assemblies of other type (Circular 276), three base assembly, wind direction indicators (Circular 296), 816 trimmer shears (Circular 295); until Nov. 22, 2925 adjustable jar wrenches (Circular 288); until Nov. 26, 150 acetylene cylinders, each about 285 cu. ft. capacity (Circular 278); until Nov. 21, wheels, right-hand and left-hand brakes (Circular 298); until Nov. 27, reworking 229 generators and 229 generator control panels (Circular 274); until Nov. 30, by-pass and relief valve assemblies, cock and control assemblies, fuel cocks, springs, connector assemblies, strainer assemblies, dial and handle assemblies, fuel relief springs, gaskets, etc. (Circular 282); until Dec. 3, 146 portable electric drills (Circular 284), one box-type electric heat-treating furnace (Circular 293).

Board of Trustees, Waterworks Department, Union City, Ind., asks bids until Nov. 20 for turbine type well pumps, high service pumps, elevated storage tank and tower, switchboard and electrical installation, pipe lines, etc., for municipal water system. Charles Hurd, Architects' Building, Indianapolis, is consulting engineer.

Steel Product, Inc., Vincennes, Ind., has been organized by James M. Barrett, Jr., and Phil M. McNagny, care of E. W. Keepfer, Fourth and Willow Streets, representative, to manufacture steel and iron products.

SOUTH CENTRAL

City Council, Memphis, Tenn., W. W. Mynatt, city manager, in charge, has been authorized to arrange bond issue of $9,000,000 for new municipal power distribution system, including substations and transmission lines for connection with high-tension system of Tennessee Valley Authority, which will furnish wholesale service. Burns & McDonnell Engineering Co., 107 West Linwood Boulevard, Kansas City, Mo., is consulting engineer.

Green Brier Distillery and Hobbs Distillery, affiliated interests, care of Paul Gerhardt, 64 West Randolph Street, Chicago, architect, have plans for two new plants near Bardstown, Ky., with power house and machine shop. Green Brier plant will cost about $250,000, and Hobbs distillery, $290,000 with machinery. Financing is being arranged.

Mobile Paper Mill Co., Crichton, near Mobile, Ala., has let general contract to Mobile Steel Co., Mobile, for addition for white paper production using Southern pine for pulp. Cost over $75,000 with machinery. W. M. Cary is superintendent.

Board of Education, Newport, Ky., plans manual training department in three-story and basement school, for which bids will soon be asked on general contract. Cost $300,000. Financing has been arranged through Federal aid. C. C. and S. K. Weber, 111 East Fourth Street, Cincinnati, are architects.

Common Council, Jeffersontown, Ky., plans installation of pumping machinery and auxiliary equipment, pipe lines, etc., for new municipal waterworks. Fund of $53,000 has been secured through Federal aid. Municipal Engineering Co., Citizens Building, Louisville, is consulting engineer.

WESTERN PA. DISTRICT

United States Engineer Office, Huntington, W. Va., asks bids until Dec. 5 for new roller gate dam at Gallipolis lock and dam, Ohio River; until Dec. 7 for two steel service boats.

Town Council, Lewisburg, W. Va., asks bids until Nov. 26 for oil engine-driven pumping unit, capacity 200-gal. per min.; 250,000-gal. filter plant and equipment, pipe lines, etc., for municipal waterworks. Wiley & Wilson, Peoples National Bank Building, Lynchburg, Va., are consulting engineers.

SOUTHWEST

Ford Motor Co., Dearborn, Mich., plans early resumption of operations at branch assembling plant at St. Louis, closed for about two years, and will make improvements in tooling and other departments.

United States Engineer Office, Postal Telegraph Building, Kansas City, Mo., asks bids until Nov. 20 for four lots of suction pipe fittings and spare parts (Circular 164).

Armour & Co., St. Joseph, Mo., meat packers, with headquarters at Chicago, have let general contract to Hastings & Morgan, St. Joseph, for extensions and improvements in local plant, including one-story unit to replace old building. Cost about $35,000 with equipment.

United States Engineer Office, Rock Island, Ill., asks bids until Dec. 5 for power control, lighting system and mechanical equipment for lock and dam No. 20, Mississippi River, near Canton, Mo., including hand-operated traveling bridge crane, two electric tow-haulage units, gasoline-electric standby power unit, crane contract rail system, switchboard, lock lighting system transformers and regulator, remote control switch cabinets, sump pump and fuel oil supply system, two recording gaging stations, air signal equipment, portable lighting equipment, etc. (Circular 97).

City Council, Crane Tex., plans installation of pumping machinery and auxiliary equipment, 50,000-gal. elevated steel tank and tower, pipe lines, etc., for new municipal waterworks. Fund of $48,000 has been arranged through Federal aid. Koch & Fowler, Central Bank Building, Dallas, Tex., are consulting engineers.

WASHINGTON DISTRICT

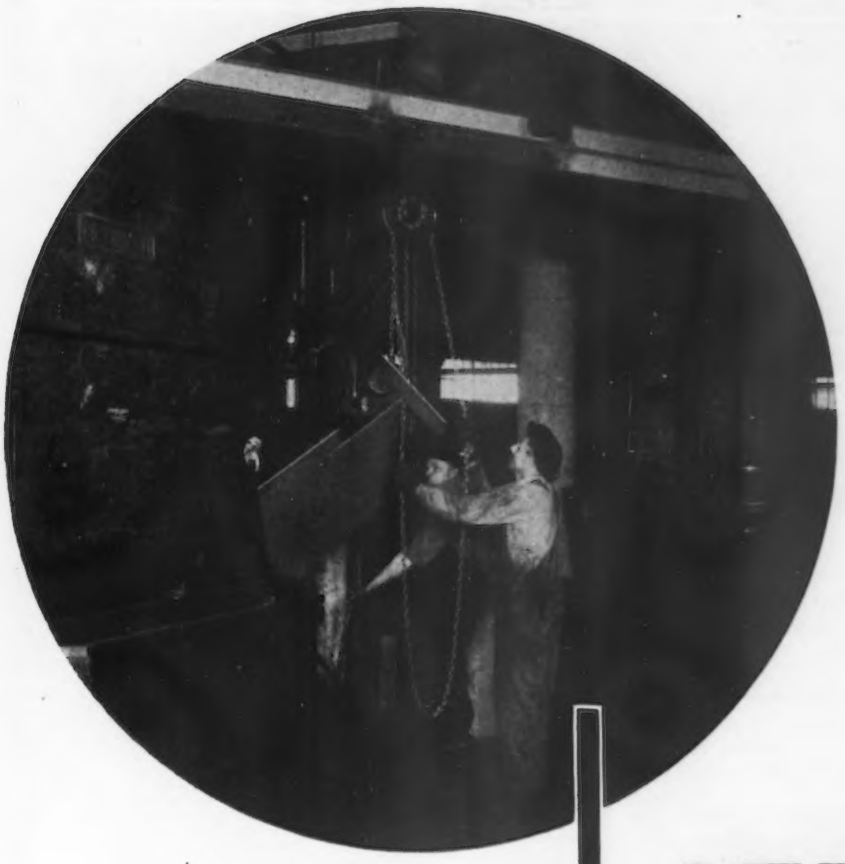
James Distillery Co., Key Highway and Montgomery Street, Baltimore, plans two-story, 40 x 60 ft., and one-story, 20 x 70 ft., additions. Cost about $25,000 with equipment.

Chief of Ordnance, United States Army, Washington, asks bids until Dec. 3 for one pulverizing mill, one spring testing machine, one folding endurance tester, two electric-operated laboratory ovens, one variable displacement pump, one refrigerating machine, six precision scales, one power Brinell hardness tester and other precision instruments and equipment (Circular 15); one deep-drawing press, one 500-ton hydraulic press, one punch press, two shell-turning lathes, one double action press, one motor-driven inclinable power press, one 2000-ton hydraulic press, one 100-ton hydraulic press and pump, one motor-driven bending machine, one forging hammer, four sheet metal-cutting shears, one turret head metal cutter, one combination crimping and bearing machine, one power metal cut-off saw, seven high-speed power hack saws, three squaring shears, one 75-ton die machine, one universal spring-coiling machine, two metal-cutting band saws, one hydraulic semi-automatic straightening press, one board drop hammer and other tools (Circular 18); 15 horizontal boring mills, four vertical boring mills, five horizontal boring, drilling and milling machines, and one 6-ft. vertical boring mill (Circular 6); until Nov. 19, 33 turret lathes (Circular 5).

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Nov. 20 for exhaust gas-heated evaporators and spare parts (Schedule 3689) for Portsmouth and Mare Island yards; one set tank level indicating gages (Schedule 3685), main condenser circulating pumps and spare parts (Circular 3684) for Eastern and Western yards; until Nov. 23, one motor-driven automatic screw machine (Schedule 3712) for Newport, R. I., yard.

MIDDLE WEST

Illinois Watch Case Co., Dundee Avenue, Elgin, Ill., manufacturer of watch cases, watch mechanisms, etc., is considering two-



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HEAVY MATERIALS DEMANDS *"NO GAMBLE"*

THE mightiest muscles of man are powerless to cope with the dead weight of heavy materials unless those muscles are teamed up with the safe, dependable YALE Chain Hoist.

A YALE Chain Hoist, regardless of its type or capacity, reduces the hazard of accident and resultant loss of man-power.

With a YALE Chain Hoist one man can safely lift and move tons of weight; he operates the hoist with a minimum of physical effort; he feels secure in the strength and power of that hoist because the name YALE guarantees that, in every part, it is of dependable quality.

Be sure—play safe—cut dollars from costs and add them to profits with a Yale Chain Hoist.

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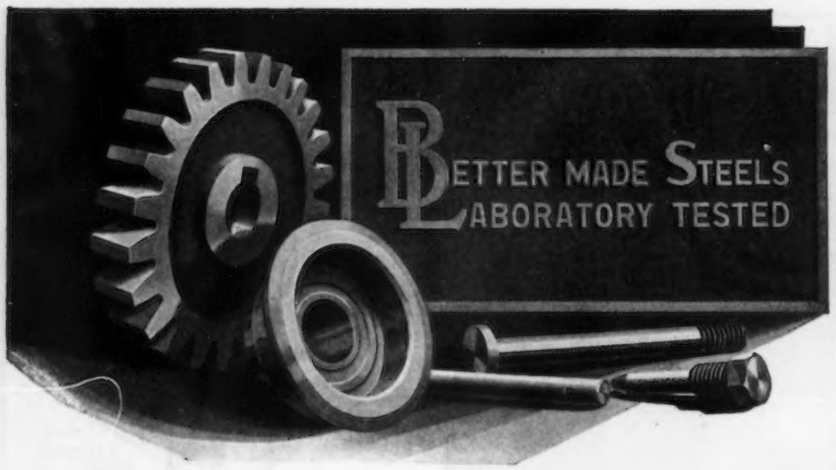
THE YALE & TOWNE MANUFACTURING CO.
PHILADELPHIA DIVISION — **PHILADELPHIA, PA., U. S. A.**



The Answer Is Alloy Steels

WHEN excessive fabricating costs endanger your profits, and persistent failures in service compromise your product—it is time to switch to B & L Alloy Steels.

They are answering many troublesome problems in the production of machine parts, as in the case of a manufacturer who sought our advice in overcoming service failures of forged cluster gears.

We recommended cutting the gears from *cold drawn steel*—and we developed a special alloy stock by testing the finished gears to destruction, until a grade was obtained that would stand greater punishment than occurred under actual service conditions.

As a result, service hazards have been eliminated, machining costs reduced, and the manufacturer is now able to make a better and tougher gear than he ever produced from forgings.

COLD FINISHED BARS
•
TURNED SHAFTING
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FREE-CUTTING SCREW STOCK

If you have a similar problem in steel, let B & L engineers help you work out the right answer.

BLISS & LAUGHLIN, INC.

HARVEY, ILL. *Sales Offices in all Principal Cities* BUFFALO, N.Y.

story and basement addition, 30 x 280 ft. Cost about $175,000 with equipment.

Lagta Separator Co., Inc., 4007 Tripp Avenue, Chicago, has been organized by Herbert A. McArthur and John B. Decker, to manufacture separating machinery and parts for dairying and agricultural service.

Seeger Refrigerator Co., 850 Arcade Street, St. Paul, Minn., manufacturer of refrigerators, parts, etc., is erecting two one-story additions, 83 x 200 ft., and 44 & 200 ft., for which George J. Grant Construction Co., 893 West Como Avenue, is contractor. Last noted structure will be used for extensions in metal-working division. Cost about $75,000 with equipment. C. H. Johnston, 360 Robert Street, is architect.

Purchasing and Contracting Officer, Quartermaster Corps, CCC, Fort Missoula, Missoula, Mont., asks bids until Nov. 21 for four drag-saws, with gasoline engine unit (Circular 37).

Pfeiffer Brewing Co., 3700 Beaufait Avenue, Detroit, has arranged for purchase of plant of Independent Brewing Co., Davenport, Iowa, for branch brewery. Extensions and improvements will be made, and new equipment installed. Cost over $45,000 with machinery. Carlton Smith is secretary of purchasing company.

City Council, Hastings, Neb., will soon take bids for turbine equipment and accessories for municipal electric light and power plant. Black & Veatch, Mutual Building, Kansas City, Mo., are consulting engineers.

MICHIGAN DISTRICT

Findley Tool & Die Co., 5680 Twelfth Street, Detroit, manufacturer of tools and other mechanical products, plans new one-story plant on Williams Street. Cost about $22,000 with equipment.

Marx Brewing Co., Wyandotte, Mich., plans extensions and improvements, including new mechanical bottling works. Cost over $45,000 with equipment.

Ford Motor Co. of Canada, Ltd., Windsor, Ont., has plans for one-story foundry at East Windsor plant, for production of alloy steel crankshafts for Ford V-8 cars and motor trucks. Cost over $400,000 with equipment.

North American Distilleries, Inc., Detroit, Frederick J. B. Sevald, Ruhl Building, treasurer, recently organized with capital of $1,325,000, has purchased property at St. Clair, Mich., as site for new plant, with power house, machine shop and other mechanical departments. Cost about $250,000 with equipment. Work will begin soon. Edward A. Loveley, Michigan Theater Building, Detroit, is president.

PACIFIC COAST

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Nov. 27 for one planer and shaper, with spare parts (Schedule 3716), one milling machine and spare parts (Schedule 3715), one universal cutter and tool grinder, and spare parts (Schedule 3717), all motor-driven, for Puget Sound Navy Yard; cartridge fuses (Schedule 3726) for Puget Sound and Mare Island yards; 4000 lb. corrosion-resisting sheet steel (Schedule 3728) for Mare Island yard.

Bauer Schweitzer Hop & Malt Co., 660 Sacramento Street, San Francisco, has plans for two-story top addition to malt house. Cost close to $30,000 with equipment. W. E. Murray, 908 Hayes Street, is architect.

Upland Lemon Growers' Association, Upland, Cal., will soon begin construction of new one-story, L-shaped packing, storage and distributing plant, 245 x 315 ft., and 100 x 110 ft. Cost about $100,000 with conveyers, loaders and other mechanical-handling equipment. W. W. Ache, 1616 Fourth Avenue, Los Angeles, is architect.

Analy Union High School District, Sebastopol, Cal., plans one-story vocational school unit at new two-story high school, for which bids will soon be asked on general contract. Cost about $20,000 with equipment. Louis C. Stone and J. R. Rowell, Humboldt Bank Building, San Francisco, are architects; Robert L. St. John, 544 Market Street, San Francisco, is mechanical engineer.

Bureau of Reclamation, Denver, asks bids until Nov. 26 for new electrical distribution system for Government Camp, Parker Dam; also for water supply system, same place (Specification 638-D); also bids (no closing date stated) for control equipment, battery charging sets, etc., for Boulder Dam power plant, Boulder Canyon, California-Nevada (Specification 601).

Standard Oil Co. of California, 225 Bush Street, San Francisco, has begun work on additions and improvements in oil refinery at Richmond, Cal., to include new unit for lubricating oil production, and increased storage and distribution facilities. Cost over $1,500,000 with equipment.

FOREIGN

Hillside Mining Co., Ltd., London, England, has leased gold-mining properties, known as Gwynfynydd Mines, in Merionethshire, Wales. Present buildings will be remodeled and improved, and new units erected. Cost over $100,000 with mining and milling, mechanical-handling and other machinery.

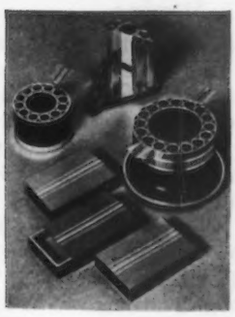
Jan Wardenier, Wolvega, Netherlands, is at head of company now being chartered, with capital of $8,500,000, to erect local plant and similar works at Amsterdam, for manufacture of a recently perfected one-cylinder, compressed-air motor for automobiles. Each plant will consist of several units for parts production and assembling, and will cost over $500,000 with machinery.

Rainy River-Kirkland Gold Mines, Ltd., Ottawa, Ont., care of E. C. Strong & Co., Inc., 40 Exchange Place, New York, investments, plans development of gold-mining properties in Kirkland district, Ontario, with installation of mining and milling machinery, conveying, hoisting, loading and other equipment. Company is arranging financing in amount of $600,000, considerable part of fund to be used for purpose noted. Robert N. Crowell, Kemptville, N. S., is president; Cecil F. Gervan, Ottawa, treasurer.

Commissariat of Light Industry, Division of Musical Instruments, Soviet Russian Government, Moscow, plans new multi-unit plant at Vladimirov, Russia, for manufacture of talking machines and parts. Cost close to $700,000 with machinery.

When you design with Alcoa Aluminum you have at your command a score of basically different ways to obtain either a decorative or protective finish. Each of these methods has capabilities of wide variation. Altogether, they help you utilize the many inherent advantages of Alcoa Aluminum. They help you design and build for appearance as well as for performance.

Plain, well-cleaned Aluminum is in the modern mode of light colors. To vary the texture and the color of the metal surface, you may polish or buff to varying degrees of smoothness. Scratch-brushing adds still different textures, and a "line" finish, on articles which can be rotated in a chuck, has great brilliance.



On castings, sand blasting or similar pressure abrasion with other materials can be used to achieve many different surface effects, both in color and texture. Tumbling with steel balls gives still a different result.

Then there is a whole family of chemical processes of finishing, almost unlimited in possibilities. Etching and pickling are the commonest. In addition there are many unique and practical coatings and color effects that are purely chemical in origin.

Aluminum may be plated with brass, nickel, and chromium, or it may be "deplated" with striking results.

The famous *Alumilite* electrolytic finish adds hardness, further increases resistance to corrosion, and is an electrical insulator too. Brilliant colors may be obtained as a corollary of this patented process.

Paints, enamels, lacquers, even vitrified enamels for decorative effects . . . all are at your service.

Technical information to help you achieve the result you want are yours for the asking. Write ALUMINUM COMPANY of AMERICA, 1885 Gulf Building, Pittsburgh, Pa.

[★There is nothing elsewhere in this advertisement to remind you that Alcoa Aluminum has the tensile strength of structural steel, but weighs ⅓ as much.]

ALCOA · ALUMINUM

CRANES and TRANSFER BRIDGES
by
CLEVELAND TRAMRAIL

CLEVELAND Tramrail Cranes and Transfer Bridges are of the underslung type and operate on a flexibly suspended runway of Tramrail rail or arch beam. The end trucks are rigidly keyed to the crane beam, the wheels are ball bearing and mounted on the end trucks by means of swivel yoke which gives perfect alignment of end trucks to the runway. The flexible runway and swiveling end truck wheels eliminate the necessity for a squaring shaft. All Cleveland Tramrail Cranes and Transfer Bridges are guaranteed against binding regardless of the position of the load on the beam.

Cleveland Tramrail Cranes and Transfer Bridges are also furnished for motor drive when required on long runs or when it is impossible because of floor obstructions to move them by hand.

Four thousand such units have been sold by Cleveland Tramrail. Some companies have 250 all told—over 100 in single plants.

Consult your 'phone directory under Cleveland Tramrail.

CLEVELAND TRAMRAIL

Hand or Electric
Overhead Materials
Transportation Equipment

DIVISION OF
THE CLEVELAND CRANE & ENGINEERING CO.
WICKLIFFE OHIO

Few Months' Experience with Working-Capital Loans

(Continued from Page 15)

whether he has any resources in case he is unable to earn enough money to repay. In ordinary banking, both of these requirements are insisted on but in the present situation the industrial advisory committee is recommending the loan if either one of these requirements can be met.

After the application is thoroughly investigated by the trained staff of the Federal Reserve Bank, a digest is made of the facts in the case, and the circumstances surrounding the individual situation. All these data are then presented to the industrial advisory committee without any recommendation. In fact these data are mailed to the members of the committee in advance of their weekly meeting to give each member an opportunity to study each case carefully and individually and form his own opinion of the application without any outside influence entering into the picture. By this method each member of the committee comes to the weekly meetings well qualified to discuss each individual case. Many angles are thoroughly considered and often the application is returned for further investigation or information, but if the members can reach a decision their recommendation is passed on to the Federal Reserve Board either to reject or accept it. Up to the present time the Federal Reserve Board has not seen fit to reject any of the loans that have been recommended by the industrial advisory committee.

Fear of Hurting One's Credit Standing

At first I was inclined to believe that section 13B would not be of much practical assistance to business men, but as the scheme has developed, I am firmly convinced that the plan will prove to be another cog in the machinery for pulling business out of the depression. Although the act has been in force for about three or four months, still I believe that it is not as yet thoroughly understood by business men in general. Furthermore, many who know of the relief offered hesitate to apply for assistance for fear that it will hurt their credit standing.

I sincerely trust that credit men will not discourage their debtors from accepting relief of this kind but rather encourage them to do so. I am sure

(Continued on Page 78)

HANDLING MATERIALS

INCREASES *costs* ADDS NOTHING TO *value*

THE less you spend for movement of materials during manufacture, the more you save in profit recovery or lowered selling costs. Practical ways of making handling operations profitable have been developed by Elwell-Parker through more than 25 years and this experience is freely at your disposal. Further modernization of Elwell-Parker Industrial Power Trucks improves user's product and reduces cost of handling through the plant. Larger loads can be moved on pallets or skids, at increased savings. Your choice of power and attachments to assure swift, economical handling of goods. The Elwell-Parker Electric Co., 4225 St. Clair Ave., Cleveland, Ohio.

New ELWELL·PARKER *Fork trucks*

INDUSTRIAL POWER TRUCKS

FROM THIS Complete LINE

of resistance welding equipment you can select the RIGHT machine for your particular job.

Thomson-Gibb makes a *complete* line of resistance welding equipment. It includes machines for spot, seam, butt, flash or projection welding metals of every practical size, shape or material.

With this complete range of equipment available, Thomson-Gibb welding experts are able to recommend without bias the one machine best suited for your particular job. Frequently, this unlimited choice avoids the danger of makeshift equipment or expensive special machines.

To get facts and performance figures on the Thomson-Gibb machine that will help you get the greatest production at the lowest cost, fill in the coupon below and mail it attached to your letterhead.

Thomson-Gibb Electric Welding Company
162 Pleasant Street, Lynn, Mass.

Gentlemen:

☐ Please ask your nearest engineer to arrange for an appointment at our plant.
☐ Please MAIL information on the welding of

Product..... Metal.....

Approximate dimensions .....

Desired production per hour.....

6148

THOMSON-GIBB ELECTRIC WELDING CO.

(Continued from Page 76)

they will find that the relief offered will eventually be a means of thawing out many frozen receivables and rehabilitating many companies that are today approaching the rocks of bankruptcy. I have often stated that our credit associations were the vehicle to be used in bringing about a successful operation in this legislation. The credit man knowing the financial condition of his customers and also having their confidence should be able to show them how to take advantage of the temporary relief offered them by section 13B of the Federal Reserve Act.

Supplements Work of Local Banks

As this committee work has progressed I have been more convinced than ever that the local banks are anxious and willing to help the business man in solving his financial problems. In the examination of these applications I have always found the banker ready to lend to business men for their seasonal requirements. However, today they may need working capital that cannot be classed as seasonal requirements and in such cases the local banks cannot be expected to transgress good banking principles and lend working or proprietary capital.

It is on these cases that the business man should appeal to the Federal Reserve for assistance without any animosity being shown toward the local banker. The Federal Reserve Banks are not attempting to take the place of the local banker in furnishing seasonal requirements, but they are attempting to extend to business men loans to be used for working capital and that may extend for a period of 3, 4 or 5 years. Therefore, you can see that the Federal Reserve Banks are not entering into competition with the local banking fraternity but are simply filling in the gap that has been made by the depression. Therefore, I appeal to the credit man and the local banker to cooperate with the business men whom they are serving, in carrying out the relief offered under section 13B of the Federal Reserve Act.

New York District Loans

Up to date, in the Second Federal Reserve District, which covers New York State, western Connecticut and northern New Jersey, we have received somewhere in the neighborhood of 2000 inquiries. This includes everyone who has made any sort of an inquiry regarding the requirements and methods to be pursued in filing a definite application. Up to Oct. 10 there had been received 300 applications amounting to $15,750,000. The industrial advisory committee has approved 68 of these applications amounting to $3,442,000, has rejected 150 amounting to $7,500,000. A breakdown of these applications is here tabulated.

NUMBERS OF INQUIRIES IN DIFFERENT CATEGORIES

$1,000 to $5,000	73	
5,000 to 25,000	81	
25,000 to 100,000	54	
100,000 to 250,000	21	
250,000 to 500,000	10	
Over 500,000	4	
		243
Divided as to:		
Manufacturers	128	
Wholesalers	36	
Retailers	47	
Service organizations	29	
Farmers	1	
Professional men	1	
By Trades:		
Textiles	10	
Men's, boys' and children's clothing	15	
General foods, groceries, etc.	14	
Automobiles	11	
Department stores	5	
Machinery	11	
Ladies' wear	20	
Printing and stationery	20	

(Continued on Page 80)

The facilities of **J & L** Warehouses form an important part of Jones & Laughlin service. Extensive stocks, placed at strategic points, await *immediate* shipment. You may have a single bar or a large lot, according to your need. Every piece is of known quality; you get exactly the steel you want, without substitution. Each **J & L** Warehouse is a big institution localized. It welcomes orders small and large, and fills them with speed, intelligence and economy.

Write for a copy of the Combined Stock List for J & L *Warehouses*

JONES & LAUGHLIN STEEL CORPORATION
AMERICAN IRON AND STEEL WORKS
JONES & LAUGHLIN BUILDING, PITTSBURGH, PENNSYLVANIA

J & L WAREHOUSES

CHICAGO	CINCINNATI	DETROIT	NEW ORLEANS	PITTSBURGH
Virginia 1600	Main 2324	Plaza 0470	Franklin 1131	Hemlock 1000

LOUISVILLE—Magnolia 1693 . . . Stock of Bars for Concrete Reinforcement and Bar Fabricating Yard

MEMPHIS—6-4836 . . . Distributing Warehouse for Pipe, Sheets, Spikes and Wire Products. Reinforcing Bar Warehouse and Fabricating Shop

J&L STEEL

For Every Need . . the Right Quality of Steel in a Full Range of Sizes

● *Above:* A Greenlee special machine, for a car builder — Oilgear Fluid Power Feed equipment helps secure the desired production.

● *At Right:* A new Oilgear Fluid Power Feed. Note: Flanged mounting, as integral machine part . . . Inside pump eliminating hazard and bettering appearance . . . Self-contained; auxiliary valves, tubing, etc. are integral with pump . . . Many other exclusive features.

NEW FLUID POWER FEEDS

•

100 to 600% More
Rapid Traverse Speed

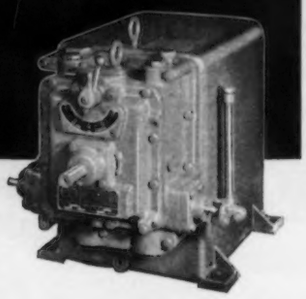
•

Up to 50% Lower Cost

•

Compensated
For Speed Variations Under Temperature and Working Conditions

Get Oilgear's Big New Book. Free, of Course



NEW records, long believed unattainable, are being hung up by Oilgear's totally new Fluid Power Feeds. Builders and buyers alike will see the significance in that. The new Oilgear book gives the whole story—better send for yours. The OILGEAR Company, 1311 W. Bruce Street, Milwaukee, Wis.

OILGEAR FLUID POWER FEEDS
(B-130)

(Continued from Page 78)

Household goods	17
Building trades	30
Jewelry	9
Drugs and chemicals	9
Beverages	9
Laundry	5
Confectionery	4

In the deliberation of the committee there is an earnest desire to approach the problem from the angle of how can this money be loaned to the applicant, with reasonable assurance that it will be repaid, or that if eventualities should arise so that it would not be repaid, how could the loan be secured? Even with such an approach it is impossible to recommend approval of the majority of these loans. Many of the applications show that

Causes of Rejection

A. The owners of the business, realizing the present business conditions, are desirous of selling out to the party making the loan, or

B. Very poor management has been exercised during the past 10 years on the part of sales, production or financial departments, and I am sorry to say that of these three classes of poor management, poor financial management predominates.

Others show that

C. (In a large number of cases) The companies have been losing money since 1929 and yet the stockholders have been drawing out dividends or the partners paying themselves the same salaries that they received during the prosperous period.

D. In many cases the companies or partnerships started their business career without sufficient capital and relied entirely upon their creditors to furnish their working capital.

Also

E. It is surprising to see such a large number of companies making application which are unable to furnish sufficient information and audited statements with which the proper information can be secured.

F. Many cases show that the applicant has frozen his working capital by selling to poor credit risks or overbought his merchandise requirements and today his working capital is tied up in unsalable inventory and uncollectable accounts receivable.

The applications show very clearly that the conditions in which the companies are today were brought about very largely by the following reasons:

1. Excessive speculation in real estate, stock market and inventory.

2. That business men did not seem to realize that prosperity could not last forever and went ahead granting credit recklessly, drawing out salaries and other personal remuneration without due regard to the earnings.

3. Failure to give their undivided attention to their own business affairs.

The problem before us today as I see it is, "Will business men profit by the mistakes they made in 1928, '29, and '30 and get back to fundamental principles that prevailed in the prewar days?" I am sure that as soon as business men realize that there is no short cut to success, but that the road leads over rough spots which means hard work, then, and not until then, will we find our way out of the mirage into which we have been led. As credit men we should never overlook the fundamentals taught to us many years ago, that in granting credit, extending loans, etc., we must never forget the three C's: Capital, Capacity and Character. I believe you all can assist in the work which the Federal Reserve Bank is endeavoring to accomplish, by referring to it your debtors who already have capacity and character but who need working capital.

Linde Process Service

saves $354

FULL STEAM AHEAD—Quick-time repair by bronze-welding fractured steam hammer cylinder saves money—cuts delay on job.

IT looked as if nothing could prevent the expenditure to replace the fractured steam hammer cylinder on the foundation company's pile driver.

A Linde Service Operator was called and, on examining the cylinder, found that it could be made as good as new by bronze-welding. With his cooperation the work was rapidly completed. The cost of materials and labor amounted to about $31—a saving of $354 over the cost of $385 for a new cylinder. Tests proved that the bronze-welded repair was fully capable of withstanding the severe service of everyday operation. The foundation company was highly pleased with the result.

Thus does Linde Process Service work to save time and money for users of Linde Oxygen. It makes available, from the melting pot of thousands of experiences in many industries, sound welding and cutting practices that have a direct bearing on your particular problems. The value of this unique service is further amplified by coordination with the vast resources, scientific research and engineering facilities of other Units of Union Carbide and Carbon Corporation.

Ask your nearest Linde Sales Office how Linde Process Service can be of assistance. These are located in Atlanta, Baltimore, Birmingham, Boston, Buffalo, Butte, Chicago, Cleveland, Dallas, Denver, Detroit, El Paso, Houston, Indianapolis, Kansas City, Los Angeles, Memphis, Milwaukee, Minneapolis, New Orleans, New York, Philadelphia, Phoenix, Pittsburgh, Portland, Ore., St. Louis, Salt Lake City, San Francisco, Seattle, Spokane and Tulsa. Everything for oxy-acetylene welding and cutting—including Linde Oxygen, Prest-O-Lite Acetylene, Union Carbide and Oxweld Apparatus and Supplies—is available from Linde through producing plants and warehouse stocks in all industrial centers.

PRODUCT OF A UNIT OF UCC UNION CARBIDE AND CARBON CORPORATION

The Linde Air Products Company

Unit of Union Carbide and Carbon Corporation

UCC

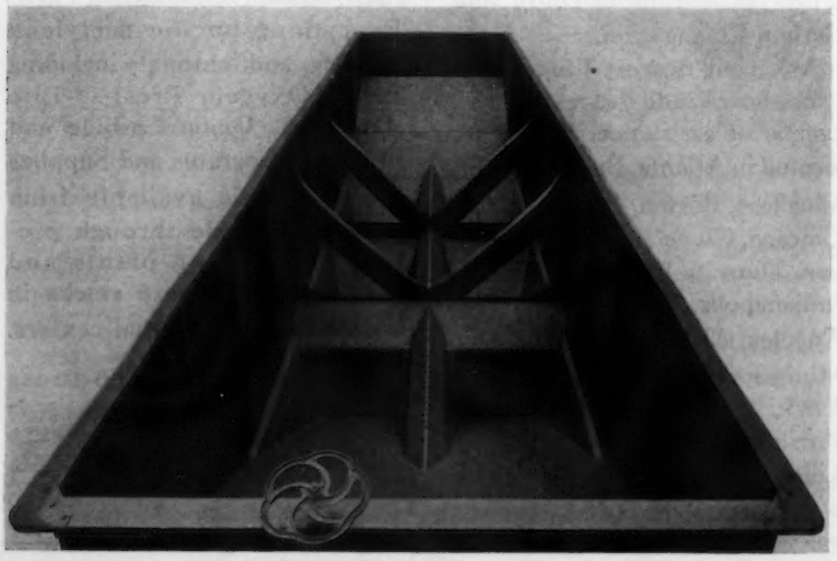
In Canada: Dominion Oxygen Co. of Canada, Ltd.

YOU CAN ORDER EVERYTHING FOR OXWELDING AND CUTTING FROM LINDE

High-Tensile Steel Used In Light-Weight Hopper Car

A NEW light-weight hopper car was exhibited last week on a private railroad siding under the Waldorf-Astoria Hotel, New York. Built by the Pressed Steel Car Co., Pittsburgh, the car weighs 30,000 lb., or about 7½ tons less than the conventional 50-ton car constructed of carbon steel, and can carry 7½ tons more pay load. The body of the car is constructed of USS Cor-Ten high-tensile, corrosion-resisting steel. While the use of this material accounts for most of the saving in weight, some of the reduction in dead load is attributable to new features in design. The car, however, does not represent a radical departure from established designs. Nothing of an experimental nature has been incorporated in the structure.

The car has 5½ by 10-in. axles and journals for which the permissible load limit on the rails is 169,000 lb. Deducting the light weight of 30,000 lb., the loading limit is 139,000 lb. The stenciled capacity is 138,000 lb., whereas the maximum revenue load of coal is estimated at 135,460 lb. The capacity of the car in terms of volume is 2328 cu. ft. A 10-in. heap would raise it to 2605 cu. ft. and a 11¾-in. heap would increase it to 2654 cu. ft.



The ratio of the American Railway Association load limit to the gross weight of the car is 82.2 per cent. The ratio of the maximum revenue load of coal to the gross weight is 81.9 per cent. Comparisons with typical carbon steel cars of 50 and 70 tons capacity are given in the table.

The car's side sheets, which are 3/32 in. thick, are buckled to give added stiffness and to resolve the bulging action of the load into tension. The side sheets are joined to two-piece side stakes, one stake being on the inside of the car and the other on the outside. The inside stake is of 3/16-in. material and is pressed into a U shape, 4¼ in. deep. The outside stake is of ⅛-in. material and is pressed into a U shape, 1 in. deep. The upper floors of the car are constructed of 3/32-in. steel, the lower floors of 4/32-in. steel and the hopper chutes of 5/32-in. material. The floor panels, like the side sheets, are of buckled design. The hopper chutes are in one piece, in contrast with the older type of three-piece hopper chutes. The one-piece chute, it is stated, eliminates corners and joints where coal and moisture can collect.

Among other new features are corrugated longitudinal hood sheets. These are intended to prevent damage by buckets and to increase the stiffness of the car structure. Also contributing to the rigidity of construction are four tubular cross ridge braces. These, used once before by the company in cars built for the Lehigh & New England Railroad, are formed from ⅛-in. material. They are first pressed into a U shape and then reduced to a tubular form, the two sides of the piece forming the tube being welded together.

Welding has also been employed to join the hood sheets to the floor panels and to fasten the door frames to the side sills. The top portion of the door frame is formed by the cross ridge

(Continued on Page 84)

MAGNEFER
PATENTED

SETS FAST · STAYS FAST!

Photograph by courtesy of The Otis Steel Company

BASIC DOLOMITE INCORPORATED

HANNA BUILDING · CLEVELAND

MAGNEFER

INSTALL - - - -

a pump which has no packings to leak, and no screen to clog; a pump that is entirely self aligning; a pump with a ball-bearing within 1 inch of the impeller; which means, of course, install a . . .

BROWNIE PUMP

write for Bulletin No. 10

THE TOMKINS-JOHNSON CO.

628 N. MECHANIC ST. JACKSON, MICHIGAN

(Continued from Page 82)

bottom reinforcing angle, which is welded to and is an integral part of the door frame. The door hinge butts are welded to the reinforcing angles. Electric welding with coated wire was used for this work.

In the main the car was fabricated by riveting. Cor-Ten rivets were employed, ⅜-in. rivets on the sides, ½ in. on the floors, ⅝ in. in the bolster construction and ¾ in. in the draft connections.

In such parts as the truck side frames and truck bolsters alloy cast steel was used in order to reduce weight. For the reservoirs of the air brakes Cor-Ten steel, welded into shape, was utilized effecting a weight saving of 139 lb. USS Man-Ten steel was employed for the brake rigging.

The builder of the car estimates that it will yield savings of more than $220 per year. This figure is arrived at by taking into account the smaller number of trains that will be required to handle the same traffic, the decrease in fuel consumption per train and the reduced number of car repairs that will follow the use of fewer cars. On the basis of reducing dead weight 7½ tons per car, the total savings per car per year would be $135. This would be enough to absorb the increased cost of the car—about 20 per cent above a 50-ton carbon steel car—in three years, it is stated.

This computation does not take into account the lower repair cost for a car of the new type. Records of repair costs for equipment of modern construction disclose an annual repair expense of about $90. The average for all freight cars on Class 1 railroads over a period when bad order cars remained nearly constant is $140. Since four of the new light-weight cars will handle as much traffic as five of the old cars replaced, the saving in repair expense would, it is estimated, equal the difference between $700 for the five old cars and $360 for the four new cars, or $340 a year, which is an average of $85 per new type of car annually.

Other advantages would result from the use of the light-weight car in periods of heavy traffic. When a railroad is moving a maximum number of cars, it is stated, the increased pay load resulting from the reduction of dead weight would yield considerable additional revenue. In 1930 the average mileage of freight cars was 10,475 per year and the average revenue 1.063c. per ton mile. With that mileage a light-weight car with its increased pay load of 7½ tons would have produced added revenue to the amount of $835.11, or nearly one-third the cost of the car, it is stated.

Harnischfeger Publishes Anniversary Book

AN attractive book, entitled "The Fiftieth Year," has just been published by the Harnischfeger Corpn. of Milwaukee in commemoration of the company's golden anniversary.

Beautifully bound in gold and purple and profusely illustrated throughout its 84 pages, this book is one of the most interesting of its kind to appear in recent years. It tells the story of an organization built in the American tradition . . . its small beginning . . . its early struggles against all manner of adversity . . . its pioneering of many types of equipment which play such an important part in the high-geared industry of today.

The Kingham Trailer Company, Inc., Louisville, Ky., has completed and is occupying modern, daylight factory with floor space of 80,000 sq. ft. This new plant is equipped with the latest type of machinery for the construction of both wood and steel bodies. A complete wood-working shop, in addition to metal shears, brakes, presses, bending and rolling machines, electric and acetylene welding and riveting equipment and complete machine shop, offers the purchaser the latest developments in trailer construction.

COMPARISON OF PRESSED STEEL CAR CO.'S LIGHT-WEIGHT HOPPER CAR WITH EXISTING REPRESENTATIVE HOPPER CARS

	P.S.C.CO.'S Light-Weight Hopper Car	Typical 50-Ton Car				Typical 70-Ton Car			
		A	B	C	D	E	F	G	H
Light weight, lb	30,000	42,500	45,800	42,300	38,500	52,400	51,500	52,500	54,500
A.R.A. load limit, lb	139,000	126,500	123,200	126,700	130,500	157,600	158,500	157,500	155,500
Ratio: $\frac{\text{A.R.A. load limit}}{\text{gross weight}}$, per cent	82.2	74.8	72.9	74.9	77.2	75.0	75.5	75.0	74.0
Cubic capacity (cu. ft.) with 10-in. average heap	2,605	2,316	2,360	2,285	1,922	2,963	2,903	2,847	2,899
Maximum revenue load of coal*	135,460	120,432	122,720	118,820	99,944	154,076	150,956	148,044	150,748
Ratio: $\frac{\text{max. revenue load of coal}}{\text{gross weight}}$, per cent	81.9	73.9	72.8	73.7	72.2	74.6	74.5	73.8	73.4

*Based on coal weighing 52 lb. per cubic foot and 10-in. average heap.